Attachment D

FINAL REPORT

BART-Oakland Airport Connector Patronage Refinement

prepared for

Bay Area Rapid Transit District

ENGINEERS
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TABLE OF CONTENTS

CHAPTER

TABULATIONS

Table

ILLUSTRATIONS

Figure

Chapter 1
INTRODUCTION

INTRODUCTION

The Bay Area Rapid Transit (BART) District is planning to implement an Automated Guideway Transit (AGT) connection to link the Oakland International Airport (OAK) with the Coliseum/Airport BART Station. This Oakland Airport Connector (OAC) AGT system would replace the existing connecting bus service (AirBART), which is operated by the airport. BART retained Wilbur Smith Associates (WSA) to develop refined forecasts of future patronage for the OAC AGT system.

The purpose of this forecasting effort was to produce new, updated forecasts that would provide a higher degree of accuracy and confidence to support the development of revenue estimates for the new service.

In 2002, an Environmental Impact Report/Environmental Impact Statement (EIR/EIS) was developed for a new transit connector between BART and OAK. WSA was part of a team that developed the project alternatives and conducted the transportation impact analysis for each alternative. The alternatives included the existing AirBART bus system service, an enhanced "Quality Bus" concept using the Federal Transit Agency (FTA) Bus Rapid Transit (BRT) approach, and an OAC AGT system option.

This report focuses on the projected future ridership with the addition of the OAC AGT system. It refines the assumptions and forecasts presented in two previous documents: the *BART-Oakland International Airport Connector Environmental Impact Report/Environmental Impact Statement* (the "EIR/EIS"), completed in 2002, and the *BART to Oakland Airport Connector Ridership Update*, completed in 2005. Depending on the system's connectivity with the rest of the BART system, assumptions on air passenger growth, service quality, and other external factors such as airport parking fees, WSA developed refined forecasts and performed sensitivity analyses on future ridership.

BACKGROUND

The Oakland International Airport is one of the fastest growing airports in the United States. Air passenger volumes at OAK increased sevenfold between 1976 and 2005, and current volumes are expected to double by year 2025, according to the Oakland Airport Master Plan (OAK MP). As OAK continues to grow and expand, so would demand for transportation linking BART and OAK.

Currently, the AirBART bus system links the Coliseum/Oakland Airport BART station to the Oakland International Airport, via bus shuttles running at predetermined intervals, mostly every 10 minutes. This current linkage requires BART passengers to exit the station and board the buses immediately outside of the BART station. Likewise, arriving passengers wishing to reach the BART station would need to wait at specially-marked AirBART bus stops, outside of the airport terminals. Adult fare is currently $2, and must be paid in exact change with cash or $2 BART tickets.[1] No change is given, and high value BART tickets will not be returned. Those without cash may be able to purchase exact fare BART tickets at the ticket machines inside the station, which accept debit and credit cards. The distance between the two locations is approximately three miles, but travel time from the BART station to OAK may range between 15 to 30 minutes, depending on traffic. Often, the roadways leading to OAK are congested and during peak airport

[1] Just prior to the completion of this report the adult fare was increased to $3.00, however, all of the analysis in this report is based on the $2.00 fare that was current at that time.

arrival/departure periods the buses can be crowded to the point where passengers may have to wait in line for one or more buses to pass before they can board. As a result the travel time reliability of the AirBART bus system is impacted by traffic conditions.

As mentioned previously, WSA was part of a team that prepared the EIS/EIR for the OAC AGT system between the Coliseum/Airport BART Station and the Oakland International Airport. The 2002 EIS/EIR addressed the Federal Transit Agency's (FTA) requirements for major new transit investments. WSA developed the project alternatives and conducted the transportation impact analysis for each alternative. The alternatives included the following:

- **Do Nothing Alternative:** Assumed the existing AirBART bus system service between OAK and the Coliseum BART Station will continue with capacity increases to serve the demand.
- **Quality Bus Alternative:** Assumed an improved bus transit service at a more convenient service level than the existing AirBART bus system service, and transit preferential treatment on roadways between the Coliseum BART Station and OAK.
- **OAC AGT System Alternative:** Assumed an OAC AGT system that would operate between the Coliseum/Airport BART Station and OAK.

Ridership forecasts were developed for each of these alternatives using an airport access model developed by Dowling Associates.

In 2005, WSA was asked to develop an update to the assumptions and forecasts presented in the EIR/EIS for the No Build Alternative and the OAC AGT System Alternative using the most current data at the time, including the OAC AGT system alignment and station concepts. This process required a review of data sources and methodology employed in the initial study, including:

- A comparison of United States airport systems, which presents available ridership forecasts and current ridership data for other direct rail to airport connections;
- Discussions on the methodology used to prepare updated forecasts for the Oakland Airport Connector; and
- Preliminary results of the modeling efforts described in the methodology.

The EIR/EIS data and methodology was updated due to an increase in AirBART bus system ridership, as well as other factors. In brief, there had been changes to the supply and pricing of airport parking, and Southwest Airlines had discontinued services at the San Francisco International Airport (SFO)[2], while increasing services to OAK. In addition, while most U.S. airports experienced decreased passenger activity for a period of time after September 11, 2001, OAK's passenger activity only declined for a short period and then recovered quickly,. The 2005 update took the above-mentioned factors into account and presented the updated ridership forecasts based on a methodology similar to that used in the EIR/EIS.

METHODOLOGY

The previous ridership forecasts were focused on determining the differences between the alternatives presented in the EIR/EIS and assessed the impacts of the OAC AGT system on the local and regional transportation network. The refined ridership forecasts presented in this report represent a more rigorous approach to forecasting ridership. The intent was to limit as much as possible the uncertainties which would directly influence ridership on the OAC AGT system. The approach was to gather information from air

[2] Southwest discontinued service at SFO in 2001 which was actually prior to the release of the EIR/EIS, however the impacts of this change were not fully experienced until after the EIR/EIS was complete.

passengers at OAK and the current users of the AirBART bus system to better understand the characteristics of those who use the airport today. The Metropolitan Transportation Commission's regional transportation model was adapted to support an airport access model developed by WSA to allow the trips to the airport to be modeled at the regional scale. This involves consideration of the entire door-to-door trip, rather than just the component of the trip that would be on the OAC AGT system.

WSA performed two extensive survey efforts. The first survey was conducted inside the Oakland Airport terminals on departing passengers. The survey was conducted to better understand the air travelers' geographic origins, destinations, travel purpose, and modes of travel to get to the airport. They were also used to estimate some of the characteristics of air travelers that are used in the mode choice models to estimate potential ridership for the OAC AGT system: average income, party size, parking costs, etc.

The second survey was an On-Board AirBART bus system passenger survey, conducted to estimate the proportion of passengers using AirBART bus system to get to work, versus accompanying air travelers, versus air passengers using the AirBART bus system as a mode of access or egress to the Oakland Airport. It also allowed WSA to estimate the share of air travelers using the AirBART bus system more precisely than the first survey. Two different survey forms were utilized – one form was designed for passengers on their way *to* the airport, while the other was designed for passengers on the way *from* the airport.

Both surveys were conducted in September and October 2006. Detailed results and forms used in the surveys may be found in the Appendices.

ORGANIZATION OF THIS REPORT

This report is organized into the following chapters:

- **Chapter 2: "Air Passenger Forecast" –** Reviews and discusses the projected air passenger volume growth at OAK, which would be a key factor in the determination of the OAC AGT system ridership.
- **Chapter 3: "OAC AGT System Ridership Forecast" –** Presents the Do Nothing and Baseline OAC AGT system ridership forecasts based on the results of Chapter 2, including their forecasting methodologies, assumptions, and several sensitivity analyses.
- **Chapter 4: "Conclusions" –** Outlines several future sets of assumptions for estimating the OAC AGT system ridership and the resulting ridership forecast.

The assumptions which underlie the OAC AGT system ridership forecasts are identified in Chapters 3 and 4. While every attempt has been to make sure these assumptions are reasonable, it is important to note that the ridership results can vary significantly if one or more of the assumptions prove to be inaccurate. Therefore, it is important when using the forecasts to fully consider the nature of the assumptions which have been used to create the forecasts.

Chapter 2
AIR PASSENGER FORECAST

INTRODUCTION

As part of the BART Oakland Airport Connector Patronage Refinement Study, WSA was requested to perform an independent review of air passenger forecasts developed in conjunction with the Oakland International Airport Master Plan (OAK MP). The OAK MP forecasts were completed in 2005 and were developed based on 2004 actual data. WSA intends to utilize the OAK MP passenger projections in the development of the BART ridership forecasts for the Oakland Airport Connector (OAC). This chapter reviews the OAK MP forecasts in light of recent regional socioeconomic trends and projections, changes in airline activity at OAK and other Bay Area airports, and other factors that may impact passenger levels in the process to validate the forecasts. The issue of capacity, and when it will become an issue at OAK, is also discussed based on the forecast review.

Several factors have been identified that can positively or negatively impact the success and growth of any airport, including OAK. In considering the validity of the OAK MP forecasts, these factors must continue to be considered. They include the following:

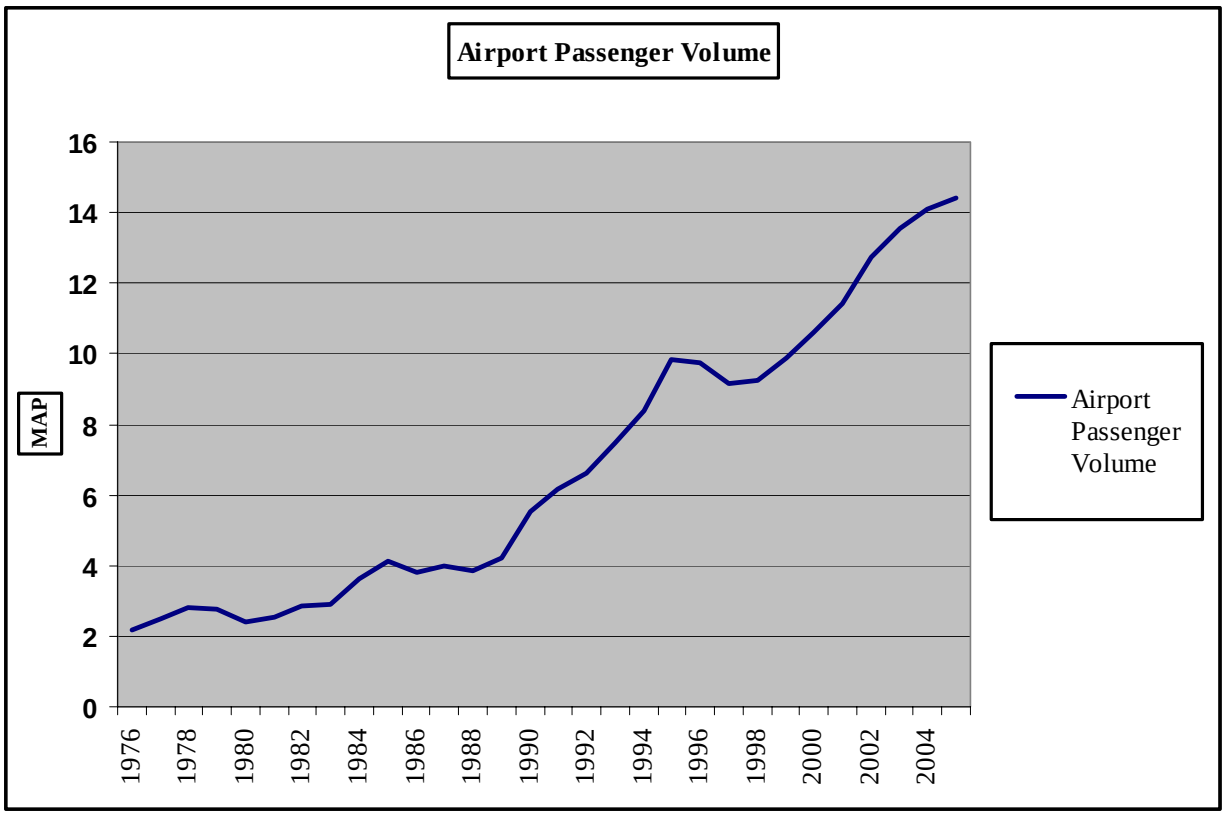
- *Continued socioeconomic growth and business development in the East Bay and the entire region.* This growth is necessary to ensure that the airport has a sufficient growing customer base, but also to ensure that sufficient attractions exist, both recreational and business-based, that will continue to bring air passengers to the region.
- *Turbulent and ever-changing airline industry.* The fate of OAK, like airports across the country, is influenced by factors such as the success of the airlines, industry woes such as recent airline bankruptcies, continued security concerns, and rising fuel prices which can negatively impact airport growth. Although an airport can invest a significant level of effort to recruit additional airline service, the decisions to add or remove airline service are ultimately made by the airlines, which are typically looking for the largest financial return on their investment.
- *Limited airside and landside capacity.* With continued growth both OAK and San Francisco International (SFO) will approach the operational capacity limits for their existing runways. In addition, the terminal capacity at OAK is projected to be exceeded by 2010 based on current passenger forecasts. Without additional capacity improvements, it will be difficult for OAK to efficiently accommodate projected commercial service activity.
- *Environmental constraints.* OAK is extremely constrained due to its location on the Bay. The area surrounding the airport is extremely sensitive to noise and pollution. Any future development at OAK would require very thorough environmental analysis and mitigation.
- *Availability of funding.* Any capacity-enhancing project at OAK would be extremely expensive. The FAA recognizes the importance of, and places high priority on, capacity-enhancing projects in the national transportation system. However, there is limited funding available to the FAA each year and they must weigh the cost/benefit of any new project. In addition, the FAA only participates in limited funding for terminal projects. Any new terminal project would need to be primarily funded through bonds, which would in turn require that the cost be recouped through higher airline fees.

REVIEW OF 2004 OAK MASTER PLAN PROJECTIONS

History of Activity at OAK

As shown in Figure 2.1, passenger volumes have grown dramatically at OAK over the last 30 years, averaging 6.8% per year. Southwest Airlines began service at OAK in 1989. In 1997, passenger volumes fell slightly due to an overall increase in fares at west coast airports. This occurred after a long period of growth spurred by a "fare war." Despite the airline industry turmoil in the last five years, OAK has continued to post growing passenger numbers since 1997. Recent growth in passenger volumes has slowed somewhat in the last two years. Between 2004 and 2005, passengers at OAK increased 2.3%. According to the OAK MP projections, passenger volumes are projected to grow at an annual average rate of 3.7%, well below the actual average annual growth that occurred overall between 1976 and 2005.

Figure 2.1
AIRPORT PASSENGER VOLUME AT OAK, 1976-2005
(MAP= Millions of Annual Passengers)



Source: Oakland International Airport, 2006

Forecast Assumptions and Methodologies Utilized

The methodology for developing airline passenger forecasts is described in Section 3.2 of the Master Plan. The forecasts were based on (1) past trend analysis, (2) FAA Terminal Area Forecasts (a "top down" forecast), (3) RAPC RASP Forecasts (a "bottom up" forecast), and (4) professional judgment using industry trends. A reasonableness test was applied based upon the 2004 Federal Aviation Administration's Terminal Area Forecast (FAA TAF) and Regional Airport Planning Committee's (RAPC) Regional Aviation System Plan (RASP) forecasts. TAF projections are developed each year by the FAA and forecast annual airline

passengers; as part of the TAF the FAA forecasts the national growth in airline passengers and allocates this growth to individual airports.

The RASP forecasts, prepared in 2000 by the Regional Airport Planning Committee (RAPC), projected aviation activity at each Bay Area airport and for the Bay Area as a whole. The RASP projections were developed prior to the 9/11 attacks and subsequent industry downturn. In preparation of the forecasts, the RAPC estimated the natural catchments area for each airport, the types of airline passenger service expected at each, and existing and new destinations. Forecasts from the 2003 *Oakland International Airport Supplemental Environmental Impact Report (SEIR)* were also referenced and included in forecast summaries.

Summary of OAK MP Passenger Forecasts

The OAK MP passenger projections are unconstrained, meaning that they do not take into account whether or not OAK has enough capacity to accommodate the projected number of passengers. The Master Plan specifically lists the following factors as having the potential to be constraints to projections and may impact passenger levels in the interim before planning or implementation may take place:

- Types of airplanes used by airlines
- Assumed taxiway and other airfield improvements
- The amount of delay that airlines and airline passengers are willing to tolerate
- Air travel market constraints
- Air traffic control rules and procedures
- Required aircraft-to-aircraft separations due to wake vortices

For planning purposes, the OAK MP rounded historic and projected passengers to millions. The abbreviation used for millions of annual passengers is "MAP." The MP projects that OAK will accommodate approximately 18 MAP in 2010, 20 MAP in 2012, and 30 MAP in 2025. This represents an average annual growth of 4.2% between 2004 and 2010, followed by 3.5% annual growth from 2010 through 2025. It was noted that these numbers are generally consistent with both the FAA TAF and RASP forecasts.

The average day of the peak month (ADPM) passenger count is used to evaluate existing facilities and to estimate future requirements. Table 2.1 summarizes the OAK MP passenger forecasts.

Table 2.1
SUMMARY OF MAP AND ADPM FORECASTS
OAKLAND INTERNATIONAL ARPORT MASTER PLAN

Year	MAP	Peak Month (August)	ADPM Passengers
2004	14	1,356,100	43,745
2010	18	1,737,457	56,047
2012	20	1,957,903	63,158
2025	30	2,895,761	93,412

Source: OAK Master Plan 2004
Note: ADPM=Average Daily Peak Month

This data was used to determine an ADPM aircraft fleet, operations, and flight schedules. Based on a rate of 6 to 6.5 departures per gate per day, it was determined that 42 to 46 gates would be needed at OAK by 2010, with an additional 4 gates needed to accommodate demand by 2012. In 2004, OAK had an average of 8.9

departures per gate utilizing 24 functioning gates. The recent expansion of Terminal 2 added five departure gates. At the same time two older gates were closed, for a total of 27 gates.

The OAK MP aircraft operations were projected through 2010. Due to uncertainty in the airline industry and future airport operations, total operations were not projected past 2010 and passenger airline projections were projected only through 2012. As shown in Table 2.2, between 2004 and 2012, airline operations are projected to increase from 430 daily operations to 598 daily operations. This represents an average annual growth rate of 4.2% over the period. These projections were developed in the OAK MP based on the number of operations that would be needed to accommodate 18 MAP by 2010. Airlines serving the airport, their fleet mix, and a target load factor of 80% were taken into consideration when these projections were developed.

Table 2.2
SUMMARY OF DAILY OPERATIONS FORECASTS
OAKLAND INTERNATIONAL ARPORT MASTER PLAN

Year	Daily Airline Operations	Daily Air Cargo Operations	Daily General Aviation Operations	Total Daily Operations
2004	430	156	352	938
2010	542	164	424	1,140
2012	598	NA	NA	NA
2025	NA	NA	NA	NA

Source: OAK Master Plan 2004
Note: NA= not available. The airport did not forecast aircraft operations past 2010 due to unreliability and uncertainty.

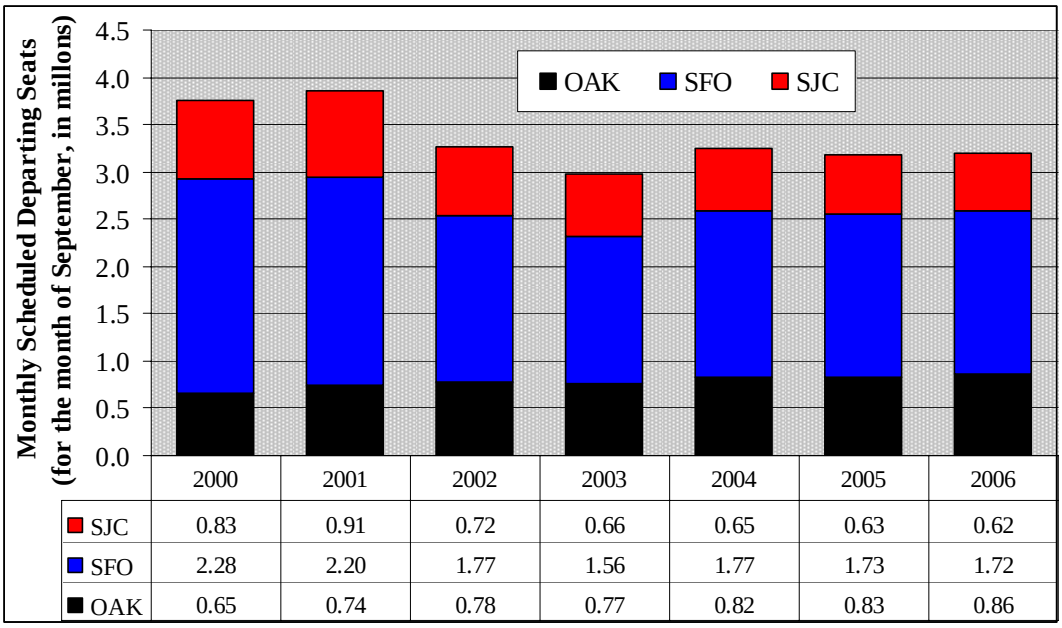
The OAK MP projects that approximately 72,300 seats daily, with an 80 percent load factor, would be needed to accommodate the 56,047 ADPM passengers projected for 2010. This is an increase from 57,600 daily scheduled seats flown in September 2006. The OAK MP also estimated that 3.2% of the seats will be required for "through" ADPM passengers.

NATIONAL AND REGIONAL TRENDS

Comparison of Regional Aviation Activity

The economic downturn and events of 9/11 led to a large decline in the level of nonstop service offered at Bay Area Airports and a subsequent decline in passenger levels. As shown in Figure 2.2, scheduled service has not fully recovered to pre-9/11 levels for the Bay Area, which includes OAK, San Francisco International (SFO), and San Jose International (SJC). SFO experienced the largest decline in monthly seat capacity following 9/11, down 36% between September 2000 and September 2003. SJC also experienced a 20% decline in scheduled seat capacity over the period. Capacity at SJC continued to experience an overall decline in capacity through 2006. OAK is the only Bay Area airport that did not experience a significant drop in capacity after 9/11. The number of nonstop departing seats at OAK was actually up nearly 18% between 2000 and 2003. This is due largely to the economic viability and lower cost structure of its major carrier, Southwest Airlines, even in light of rising costs impacting the entire industry. Nearly 61% of all the scheduled departing seats in the Bay Area took off from SFO in 2000, compared to approximately 54% in 2006. During the same period, the percent of Bay Area seats departing from OAK have grown from 17% in 2000 to 27% in 2006.

Figure 2.2
TRENDS IN BAY AREA SCHEDULED DEPARTING SEATS SINCE 2000
MONTHLY SCHEDULED SEATS
September 2000-2006



	2000	2001	2002	2003	2004	2005	2006
SJC	0.83	0.91	0.72	0.66	0.65	0.63	0.62
SFO	2.28	2.20	1.77	1.56	1.77	1.73	1.72
OAK	0.65	0.74	0.78	0.77	0.82	0.83	0.86

Source: Official Airline Guide

In order to identify trends that have occurred in the Bay Area airports since the Master Plan was completed; the change in activity at the Bay Area airports since 2003 was reviewed in more detail. Table 2.3 provides a summary of monthly scheduled departing seats from 2003 through 2006. SFO has maintained over half of the region's airline seat capacity over the last four years. With 12.4% growth since 2003, OAK is currently experiencing a faster overall growth in airline capacity than the two other major Bay Area airports, and much more growth than the total of the three combined. In addition, SFO has experienced overall capacity growth between 2003 and 2006, although SFO scheduled departing seats declined between 2005 and 2006. SJC witnessed a steady decline in scheduled airline capacity since 2003.

Table 2.3
SUMMARY OF REGIONAL AVIATION ACTIVITY
MONTHLY SCHEDULED DEPARTING SEATS 2003-2006

Origin	2003	2004	2005	2006	% Change
OAK	768,617	821,202	825,819	864,281	12.4%
SFO	1,556,389	1,772,711	1,728,667	1,719,171	10.5%
SJC	659,774	645,988	626,119	621,255	-5.8%
Total	2,984,780	3,239,901	3,180,605	3,204,707	7.4%

Source: Official Airline Guide

In terms of monthly scheduled airline departures, OAK also experienced steady growth, as depicted in Table 2.4. While departures at OAK have increased slightly less than at SFO since 2003, they are still growing faster than the combination of the three study airports, due to the loss in activity at SJC.

Table 2.4
SUMMARY OF REGIONAL AVIATION ACTIVITY
MONTHLY SCHEDULED DEPARTURES 2003-2006

Origin	2003	2004	2005	2006	% Change
OAK	5,825	6,134	6,166	6,383	9.6%
SFO	11,695	12,549	12,616	12,830	9.7%
SJC	5,590	5,422	5,340	5,264	-5.8%
Total	23,110	24,105	24,122	24,477	5.9%

Source: Official Airline Guide

Table 2.5 offers more detailed data of monthly scheduled seat activity at Bay Area airports, including recent changes in domestic capacity by published carrier and a summary of international capacity. The level of scheduled domestic departing seats at OAK grew more rapidly than at SFO and SJC, up 13% since 2003. Overall, OAK has experienced nearly twice the growth in domestic capacity than the combination of the three airports between 2003 and 2006.

The growth in airline capacity at OAK has been fueled largely by one carrier, Southwest Airlines. Southwest has added nearly 90,000 additional monthly scheduled departing seats and 584 monthly departures since 2003. This is an average of 19 additional daily departures by the carrier since 2003. Southwest added new nonstop service to Denver and cross-country flights to Baltimore and Philadelphia. Southwest also announced nonstop service between Oakland and Boise in August 2006. A new carrier, ATA Airlines, also began flying out of OAK in 2006. ATA moved from SFO due to its recent code-sharing partnership with Southwest Airlines. This strategic alliance allows passengers flying on Southwest to access Hawaiian destinations, as these routes have historically been lucrative for many airlines. Legacy carriers United and American have cut capacity in the OAK market, while capacity offered by low fare carrier JetBlue has remained relatively unchanged over the last few years. In 2006, 75% of the monthly departing seats at OAK were on low fare carriers.

United Airlines, which operates a "hubbing" operation at SFO, is the Bay Area's largest domestic and international airline. United declared Chapter 11 bankruptcy in December 2002 and emerged just over three years later in February 2006. Following 9/11, United and many other carriers reduced capacity drastically at SFO as the legacy carriers implemented many cost-cutting measures. However, since 2003, United has increased scheduled capacity at SFO by 15% and begun serving or reinstating service to several new destinations. United's strategy for profitability in the future includes a large increase in international capacity, which tends to provide higher yields than most domestic flights. SFO has become a key city for the airline's restructuring. Between 2003 and 2006, United began nonstop service to 14 new destinations, including international service to Cancun, Los Cabos, Puerto Vallarta, Edmonton, Toronto, Nagoya, and Beijing.

Table 2.5
DETAILED REGIONAL AVIATION ACTIVITY
MONTHLY SCHEDULED DEPARTING SEATS, BY CARRIER, SEPTEMBER 2003-2006
DOMESTIC CARRIERS

DOMESTIC CARRIERS							
Origin	**Published Carrier (includes regional partners)**	**2003**	**2004**	**2005**	**2006**	**% Change**	**New Destinations Since 2003**
OAK							
	Alaska Airlines	70,012	68,470	70,096	67,454	-4%	
	Aloha Airlines	13,392	16,368	9,300	10,540	-21%	
	America West Airlines	26,413	36,416	38,410	29,142	10%	SJD
	American Airlines	19,856	20,672	16,320	15,776	-21%	
	ATA Airlines	-	-	-	21,000	NA	ITO, HNL, OGG
	Continental Airlines	12,671	9,533	9,021	13,030	3%	
	Delta Air Lines	16,090	28,290	17,240	18,505	15%	
	JetBlue Airways	68,640	75,660	75,816	70,980	3%	FLL
	Southwest Airlines	467,087	487,397	525,516	556,860	19%	BWI, DEN, PHL
	United Airlines	57,650	66,668	47,112	48,114	-17%	
OAK Domestic Departing Seats		751,811	809,474	808,831	851,401	13%	
SFO							
	AirTran Airways	-	7,424	8,220	13,015	NA	ATL, IND
	Alaska Airlines	84,024	82,950	84,952	83,106	-1%	
	America West Airlines	51,966	65,128	49,230	48,762	-6%	
	American Airlines	161,985	175,849	172,588	178,936	10%	
	ATA Airlines	41,653	48,889	29,402	-	-100%	
	Continental Airlines	52,912	53,506	57,259	60,188	14%	
	Delta Air Lines	97,126	109,849	128,807	82,382	-15%	
	Frontier Airlines	15,232	15,252	18,858	36,828	142%	LAX
	Hawaiian Airlines	7,560	7,560	7,560	7,560	0%	
	Independence Air	-	-	8,580	-	NA	
	Midwest Airlines	5,916	7,055	3,480	8,700	47%	
	Northwest Airlines	56,290	53,900	61,344	66,588	18%	HNL, IND
	Spirit Airlines	-	-	-	4,140	NA	DTW
	Sun Country Airlines	486	5,184	4,860	4,860	900%	
	United Airlines	729,954	866,378	819,979	842,855	15%	ABQ, AUS, PEK, CUN, COS, YEG, SJD, NGO, ONT, PSP, PVR, SAT, YYZ, TUS
	US Airways	42,449	51,883	41,969	46,626	10%	
SFO Domestic Total		1,347,553	1,550,807	1,497,088	1,484,546	10%	

Table 2.5, Continued
DETAILED REGIONAL AVIATION ACTIVITY
MONTHLY SCHEDULED DEPARTING SEATS, BY CARRIER, SEPTEMBER 2003-2006

Origin	Published Carrier (includes regional partners)	2003	2004	2005	2006	% Change	New Destinations Since 2003
DOMESTIC CARRIERS							
SJC							
	Alaska Airlines	60,283	60,718	54,744	55,430	-8%	
	America West Airlines	28,686	32,300	35,192	39,950	39%	
	American Airlines	165,474	148,618	109,050	99,182	-40%	
	ATA Airlines	10,915	-	-	-	-100%	
	Continental Airlines	11,281	14,942	13,812	15,666	39%	EWR
	Delta Air Lines	25,848	25,120	28,862	22,502	-13%	
	Frontier Airlines	8,692	9,314	12,378	12,900	48%	
	Hawaiian Airlines	-	-	504	7,560	NA	HNL
	Independence Air	-	-	660	-	NA	
	JetBlue Airways	-	4,680	14,040	10,140	NA	BOS, JFK
	Northwest Airlines	16,776	8,760	8,880	8,880	-47%	
	Southwest Airlines	271,499	280,896	287,905	291,613	7%	
	United Airlines	53,068	53,192	50,774	49,072	-8%	
SJC Domestic Total		652,522	638,540	616,801	612,895	-6%	
Domestic Grand Total		2,751,886	2,998,821	2,922,720	2,948,842	7%	
No. of Nonstop Destinations Served							
							INTERNATIONAL CARRIERS
OAK International Total		16,806	11,728	16,988	12,880	-23%	
SFO International Total		208,836	221,904	231,579	234,625	12%	
SJC International Total		7,252	7,448	9,318	8,360	15%	
International Grand Total		232,894	241,080	257,885	255,865	10%	

NA = Not Applicable
Source: Official Airline Guide

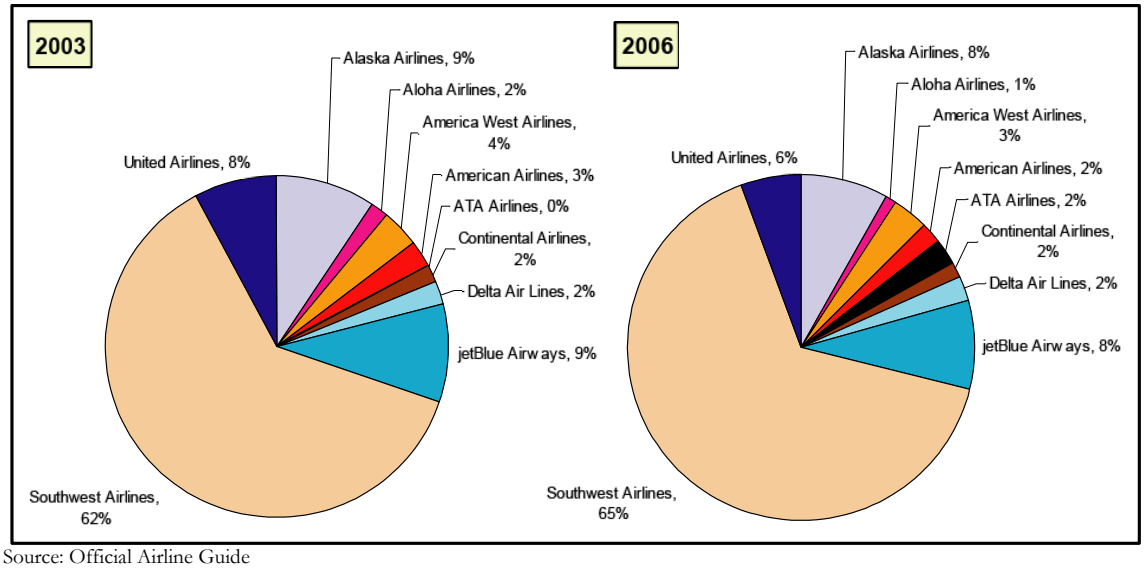
SFO has decreased the airport's landing fees significantly to bring additional service. Several legacy carriers at SFO, including American, Continental, and Northwest, have had modest increases in capacity at SFO since 2003. Even though ATA moved to OAK, SFO has attracted two new low fare carriers since 2003: AirTran and Spirit. Frontier has doubled capacity in the market as well. When all scheduled departing seats are combined, low-fare carriers at SFO account for 3% of the total airport capacity.

SJC has struggled to maintain capacity and attract additional service since 2003. SJC is served by several low fare carriers including Southwest, Frontier, and JetBlue, which began serving the airport in 2004. These low fare carriers have modestly increased the number of departing seats they offer from SJC over the last three years. Low fare carriers accounted for 51% of the total departing seats at SJC in 2006. Legacy carriers including Alaska, American, Delta, Northwest, and United have all decreased capacity offered in the market. American alone offers 40% fewer scheduled departing seats than it did three years ago at SJC and discontinued service to five destinations including St. Louis, New York-Kennedy, Boston, Honolulu, and Maui. However, Hawaiian Airlines, a codeshare partner of American, began service from SJC to Honolulu in 2005.

Nearly all of the international capacity in the Bay Area (92%) departs from SFO. SFO has witnessed an increase of 12% in international carrier capacity since 2003 although it has not fully recovered from the cutbacks experienced by international carriers after 9/11. OAK accounted for 5% of the Bay Area international departing capacity in September 2006 and SJC accounted for the remaining 3% of capacity. Although OAK has actually lost 23% of capacity operated by international carriers since 2003, a new Canadian carrier, Harmony Airways, began nonstop service to Vancouver and Azores Express began seasonal service to the Azores at OAK in June 2006. International carriers account for only 1.5% of total OAK capacity.

As shown in Figure 2.3, Southwest has increased its share of scheduled departing seats at OAK between 2003 and 2006. When combined with market share for ATA, its code-share partner, the carrier comprised 67 percent of all departing seat capacity, compared to 62 percent three years earlier. This indicates the continued strength of the carrier in the market.

Figure 2.3
CARRIER MARKET SHARE OF SCHEDULED DEPARTING SEATS AT OAK, 2003 & 2006



Source: Official Airline Guide

Projections of Socioeconomic Activity

There is typically a close correlation between aviation demand and a region's socioeconomic growth. Forecasts of socioeconomic data support the OAK Master Plan forecasts that passengers at OAK will increase. Table 2.6 presents forecasts for the number of households, total population, and employment for Alameda County, the OAK primary service area, and the Bay Area as a whole. Total population and households are expected to grow at an average of nearly 1%, while employment is expected to grow by 1.5% throughout the Bay Area and the more concentrated OAK primary service areas. Forecasted rates for household and population growth fall slightly below the projected national annual growth rates (1.03% and 0.98%, respectively). However, forecasted growth rates for employment are higher than the national rate of 1.33%, revealing a continued heightened demand for business-related travel in the primary service area of OAK.

Table 2.6
REGIONAL SOCIOECONOMIC FORECASTS

	2005	2006	2010	2020	2030	AAG*
Total Households						
Alameda County	551,726	556,677	576,489	631,899	690,721	0.90%
OAK Primary Service Area	1,386,836	1,400,409	1,454,726	1,588,088	1,716,031	0.86%
Total Bay Area	2,537,286	2,559,720	2,649,425	2,883,093	3,116,832	0.83%
Total Population						
Alameda County	1,565,943	1,581,170	1,642,108	1,779,215	1,949,819	0.88%
OAK Primary Service Area	3,825,691	3,864,572	4,020,126	4,363,300	4,715,563	0.84%
Total Bay Area	7,008,438	7,073,259	7,332,572	7,992,775	8,632,151	0.84%
Total Employment						
Alameda County	774,024	789,335	850,591	997,068	1,140,346	1.56%
OAK Primary Service Area	1,698,843	1,729,199	1,850,664	2,144,435	2,444,843	1.47%
Total Bay Area	3,197,058	3,253,866	3,481,178	4,067,396	4,688,091	1.54%

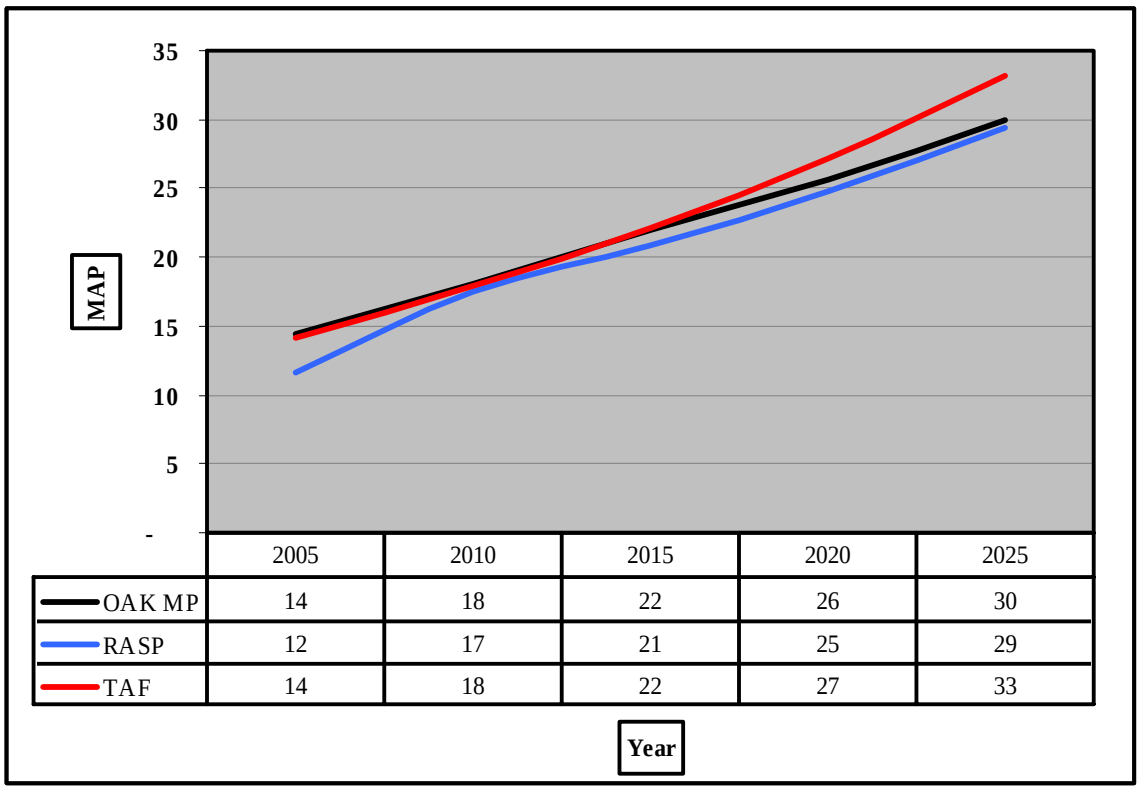
Source: Metropolitan Transportation Commission
Note: AAG=*Average Annual Growth Rate

The City of Oakland has also experienced business growth in recent years, supporting the need for continued air service growth at the nearby airport. According to the State of the City Report 2006, Oakland experienced a 22% increase in new businesses since 2001, including over 300 new businesses in technology, retail, food processing, and transportation. Oakland is just one of ten U.S. urban areas (out of 82 total) that is adding jobs.

Changes in Trends since the Completion of OAK MP

The OAK MP used the base year 2004 to forecast future demand for air travel. Figure 2.4 shows MAP (million annual passengers) forecasts through 2025 for the OAK MP, 2000 RASP, and the updated 2006 TAF. The FAA updates the TAF each year. The updated TAF projections reveal a similar forecast to the OAK MP through 2015 and a slightly higher growth rate of 4.1% through 2025 (compared to the 2010-2025 growth rate of 3.2% in the OAK MP), resulting in a forecast of over 33 MAP in 2025, compared to the 2025 extrapolated estimate of 30 MAP when the OAK MP projections were completed.

Figure 2.4
MAP FORECASTS WITH UPDATED 2006 TAF



	2005	2010	2015	2020	2025
OAK MP	14	18	22	26	30
RASP	12	17	21	25	29
TAF	14	18	22	27	33

Sources: OAK Master Plan 2004
Note: MAP = Million Annual Passengers

Current Activity

Current OAK Passengers Versus 2004 Projected Passengers

Based on recent trends, it is estimated that approximately 14.5 MAP will utilize OAK in 2006. In the 2004 OAK MP, it was projected that approximately 15 MAP would utilize the airport, a difference of approximately 0.5 MAP. The projected 2004 to 2006 growth rate assumed in the OAK MP was approximately 4.3% per year, while the early estimates of actual 2006 passengers show the true growth rate from 2004 to 2006 to be only 1.2% per year.

Existing Airline Service

In September 2006, OAK was served by 15 air carriers, ten domestic and five international, which served a total of 47 destinations worldwide. Despite being served by five international carriers, the vast majority of airline service at OAK is domestic, comprising 98.5% of total airline capacity. As explained above and shown in Table 2.5, OAK is the fastest growing major Bay Area airport in terms of airline capacity, growing faster than SFO and SJC in recent years. Southwest Airlines is the dominant carrier at OAK. Three-fourths of all scheduled seats at OAK depart on low fare carriers.

Factors that Could Impact Forecasts

The OAK MP noted how difficult it is to develop accurate long-term projections of passengers. There are many unknowns or what the OAK MP refers to as "trend-breakers" that are bound to occur and are unpredictable. The OAK MP noted the following "trend-breakers" that have occurred over the last 30 years and may continue to impact passenger forecasts into the future:

- Airline deregulation
- Gulf War
- September 11, 2001
- Jet fuel availability and prices
- SARS
- Economic downturns
- Low-fare carrier competition
- New types of airlines

There are several airline industry events and trends that have occurred recently that may impact the OAK MP projections. Among these, jet fuel cost continues to be the most unpredictable. Since 2000, the cost of jet fuel to American air carriers has risen from $0.90/gallon to $1.98/gallon, a change of 120% in six years. However, costs of fuel to automobile commuters has increased at staggering rates as well, and the possibility that air travel is more affordable for 200 to 500-mile trips may actually help the airline business. However, the "hassle-factor" for air travel due to tighter security has increased drastically over the last few years as well and continues to deter passengers from flying on shorter routes. This includes the very recent incident in England which resulted in passengers being prohibited from carrying any liquids onto aircraft. This has resulted in a significant increase in checked baggage, requiring more time for passengers who are traveling on any length of haul, including the short-haul segments.

Since 9/11, all carriers, but especially legacy carriers, have been forced to lower all costs associated with their operating structure. Labor costs have been particularly damaging to the airline industry, as several major air carriers have gone out of business or filed for bankruptcy since 9/11. Several carriers serving OAK have emerged from bankruptcy since the OAK MP was completed including United and Aloha. Both Delta and Northwest Airlines are still in bankruptcy. At OAK, only 2.1% of the airline capacity is currently flown by airlines in bankruptcy. If another air carrier at OAK filed for bankruptcy or goes out of business, it would impact the OAK MP forecasts.

Despite continued high fuel prices and large amounts of debt, the domestic airline industry has been emerging as a stronger, leaner industry. Legacy carriers have been forced to adjust their cost structures, which today look more similar to that of low-fare carriers. In addition, carriers have cut capacity in many places across the country and have been very selective in the markets to which they add capacity. Low fare carriers Southwest and JetBlue have remained profitable over the last few years, coping with high fuel costs and growing pressure from the traditional legacy carriers. In September 2006, 75% of the seat capacity at OAK was on Southwest, ATA, and JetBlue. These carriers are by far some of the strongest in the industry, have posted the largest profits in recent years, and have the greatest expansion potential.

Airline competition can impact the forecasts of OAK passengers as well. It has been difficult for many legacy carriers with higher cost structures to compete effectively at OAK, which has traditionally been an airport offering the lowest fares in the country.

Finally, the public perception of airline safety and security has had a major impact on air travel. In the months following 9/11, the airline industry reported $8 billion in losses, despite $5 billion in governmental stabilization payments. Another terrorist attack on the United States, or even the potential such as the recent London incident, could cause a similar downturn in national airline business. Confidence in the airline industry may also affect passenger's willingness to travel.

It is believed that none of these recent trends will have a drastic impact on passenger levels at OAK. However, there are many other unforeseeable factors that could impact the realization of the projected passenger numbers and can not be predicted accurately.

CAPACITY ISSUES

OAK MP Capacity Findings

The OAK MP recognizes both landside and airside capacity limitations that currently impact and will continue to impact efficient airline operations through the forecast period.

The OAK MP developed recommendations for the number of new gates that need to be constructed before the planning date of 2012 in order to accommodate future passengers. The original terminal at OAK was designed to accommodate 8 MAP. Table 2.7 reviews OAK MP forecasts of MAP from the year 2005 through 2010, as well as the planning date of 2012. OAK currently has 24 operational and five under-construction departure gates (scheduled to be operational in 2007, but which will only result in an addition of three gates due to landside limitations), which would be greatly stressed with the 18 MAP forecasted for 2010.

Table 2.7
OAK MP FORECASTS AND DEPARTURE GATE

		RECOMMENDED	ACTUAL
	Projected MAP	6 Departures/gate/day	8.6 Departures/gate/day
		Gates Required	Gates Required
2005	14.5	***36***	25
2006	15.1	38	26
2007	15.7	39	27
2008	16.4	41	***29***
2009	17.1	43	30
2010	18.0	46	32
2012	20.0	50	39

Source: OAK Master Plan
Note: OAK MP calculations (and derived forecasts) are based on the peak month of August.

The OAK MP considers 6 to 6.5 departures per day per gate to be optimal. This is comparable to the national average of 5.5 departures per gate per day. Based on this ideal service level, it was estimated that the airport would need between 46 and 50 total gates to accommodate passenger demand in 2010-2012 at a utilization rate of 6 turns per gate. The existing gates are currently running at a capacity of 8.6 departures per day. This increased number of departures per gate increases the potential for delay and puts additional pressure on the airlines to run their operations as efficiently as possible. At OAK, Southwest utilizes half of the gates. The number of departures per gate for Southwest Airlines is typically much higher than even 8.6 per day. In the OAK MP, it was noted that daily gate usage by Southwest was 10.3 departures per day in June 2004. Under the recommended number of commercial airline departures per gate (6 to 6.5/day), OAK would have exceeded capacity in 2005, when it would have required 36 gates. Under its current rate of

departures per gate, OAK will reach capacity in 2008. However, if Southwest continues to occupy additional gates, the airport may be able to accommodate even more airline operations.

Construction of new departure gates would only accommodate the landside needs of commercial service airlines. Pressure is also being placed on the operational capacity of the primary runway at OAK, Runway 11-29. Table 2.8 details demand and capacity for Runway 11-29 for 2004 and projected ratio for 2010. In 2004, total operations on Runway 11-29 (82% of which are passenger airlines) were already at 80% of annual service volume (ASV). In 2010, operations are expected to be at 98% of annual capacity. Delays associated with operating an airport approaching 80% of annual operational capacity can be notable. FAA guidance suggests that when an airport approaches a demand/capacity ratio of 80%, it should implement capacity improving projects.

Table 2.8
OPERATIONS TO ANNUAL SERVICE VOLUME COMPARISON, RUNWAY 11-29

	2004		2010	
	No. of Operations	**% of Total**	**No. of Operations**	**% of Total**
Passenger Airlines	156,950	82%	197,830	84%
All Other Operations	34,675	18%	36,500	16%
Total Operations	**191,625**	**100%**	**234,330**	**100%**
Annual Service Volume	240,000		240,000	
Demand/Capacity Ratio	80%		98%	

Source: OAK Master Plan

Although many airports can still operate above their 100% ASV, the chances for delays to occur are greatly increased. The potential for delay could impact an airline's ability to add additional flights at OAK and may deter additional carriers from entering the OAK market due the possibility of inefficient operations. The OAK MP estimates that the number of aircraft operations required to serve 18 to 20 MAP can be accommodated with a slight increase in delay, The OAK MP noted that delays will occur much more frequently at the 25 MAP level. This will be reached in the 2015-2025 time period.

FAA Capacity Recommendations

The FAA Operational Evolution Plan (OEP) is a program committed to building capacity and increasing efficiency at the 35 busiest airports in the United States, one of which is OAK. The OEP identifies needs for a ten-year timeframe, and with each passing year the timeframe rolls forward one year. Thus, programs of the OEP are only approved if they can be accomplished within the future ten years. The OEP has implemented several projects in the last few years to improve operational efficiency at OAK including Time-Based Metering and User-Preferred Routing both of which will provide more information to air traffic controllers to increase efficiency of OAK airport operations.

The Future Airport Capacity Task (FACT) study was undertaken as part of the OEP specifically to study capacity at these 35 airports. FACT recognizes that OAK has experienced substantial growth, which will likely continue. The study states that OAK will need substantial capacity upgrades by 2013 and again in 2020. This federal study supports projections that OAK will grow substantially within the next ten years and that there is a continued need for capacity-enhancing improvements. However, no specific projects were identified for OAK in this study.

No Current Plans/Designs for New Runway or Adequate Terminal

In 2000, the Regional Airport Planning Committee conducted a detailed study of aviation growth in the Bay Area and methods to manage and accommodate this growth. A major recommendation that emerged from this study was for both SFO and OAK to build another major runway to meet increased operational capacity between 2010 and 2020. However, since the event of 9/11, neither airport currently has plans to build a new runway. This is largely due to the environmental implications and exorbitant costs that would be associated with filling in areas of the Bay to provide additional land needed for the runways.

In the OAK MP, it is recommended that studies be conducted for the construction of a new 17- to 21-gate airline passenger terminal. This would meet the 46 to 50-gate total required for the 2010 to 2012 timeframe. However, this new terminal would only meet projected capacity that is now only four years away. It does not account for the 30 MAP forecasted by the master plan. OAK is currently moving forward with plans to construct a third terminal. An environmental review would need to be completed before construction can begin. It is estimated by WSA that the overall process to build a new terminal at OAK could take five to seven years, once it is formally approved. Given that the environmental review has not been undertaken, the combined timeframe for environmental clearance and construction would put the earliest opening of a new terminal by 2015.

SUMMARY

The OAK MP projections of passenger activity appear to be conservative based on several items noted in this analysis including:

- The average annual rate of growth used to project passengers at OAK through 2025 (3.7%) is well below the historic average annual growth rates of 6.8% (1976-2005) and the 1997-2005 average annual growth rate of 5.9%. The rate is on target with the rate developed for overall U.S. air passenger growth (3.7% per year on average) developed by the FAA for the Aerospace Forecast Fiscal Years 2006-2017.
- Southwest Airlines, which currently accounts for 65% of the departing seat capacity from OAK, is the most profitable domestic carrier, despite the strains to the industry the last five years. Southwest is committed to continue to grow at OAK, recently adding new service to Boise and Baltimore.
- Because of the stability of the low fare carriers, passengers and capacity at OAK have grown despite industry downturn, especially when compared to other Bay Area airports.
- The FAA's TAF projections released in 2006 estimate that passengers at OAK will reach over 33 MAP, compared to 30 MAP projected in the OAK MP.
- Projected employment growth for Alameda County and the entire Bay Area is higher than the U.S. national average. Commercial and residential development in the City of Oakland has grown substantially over the last five years, due to several local initiatives. Strong socioeconomic growth is a large driver of a community's ability to sustain and obtain additional air service.

Even though the Oakland International Airport projections of 18 MAP by 2010 and 30 MAP by 2025 are conservative estimates, the airport will not be able to efficiently accommodate these passengers due to limited landside and airside capacity. The existing terminal and gate space (including the gates currently under construction) at OAK will not be able to process the projected number of passengers. As noted in the OAK MP, ideally 400,000 annual passengers can most efficiently be accommodated by each departure gate or 6 to 6.5 departures per day per gate. According to recent discussions with OAK airport management, it is estimated that 600,000 is the average number of annual passengers that is currently handled by each gate at OAK. Gates operated by Southwest Airlines exceed this volume. Based on this estimate, only 16.2 MAP can

be handled by the 27 existing and under-construction gates. In order to accommodate the 30 MAP projected in 2025, a minimum of 23 additional gates, or 50 total gates, would be needed based on the estimate of 600,000 passengers accommodated per gate each year. However, based on the ideal number of passengers that should be accommodated by each gate (400,000), 75 departure gates would be needed to accommodate 30 MAP by 2025.

However, in the near term, it is expected that this 600,000 annual passengers per gate will continue to be stretched at OAK, especially as Southwest Airlines continues to operate above this number. In conclusion, it is estimated that the existing gates can accommodate a maximum of 17.4 MAP. This may coincide with some level of operational delays. This equates to 54,178 average daily passengers in the peak month. It is estimated that 3.2% of these passengers are "through" or connecting passengers. Based on this assumption, an estimated 52,400 daily passengers would originate at or be destined for OAK in the peak month.

Based on OAK MP forecasts, which are appropriate in light of the various factors that could impact projections, the existing terminal and gate layout cannot accommodate the 2010 projected MAP. It will be difficult and expensive for OAK to build an additional terminal with enough gates to accommodate the projected passenger levels. It is estimated that it would be extremely difficult for OAK to build a new terminal before 2015.

IMPACT ON BART PROJECTIONS

As previously noted, the OAK MP projections of passenger activity appear to be conservative for the region, however, it has been noted that with existing constraints, it is unlikely the OAK will be able to accommodate the projections of passenger activity. For purposes of the this project, 2030 is used as the horizon year compared to OAK MP's 2025. However, given the constraints, OAK's passenger activity levels are likely to level out by 2015 with limited growth potential unless the previously noted constraints are addressed.

Discussions with OAK airport management and review of the OAK MP have focused on the Airport's current capacity limitations. Without expansion of the terminal facilities as well as runways, it appears that it will be nearly impossible to accommodate the passenger projections of 30 MAP by 2025 or 2030. While plans are being considered for various improvements at the Airport, the only approved projects at this time include development of additional gates to provide a total of 27 gates in the near term. Under the current Airport Development Plan (ADP), a maximum of 34 gates can be developed at the Airport, without construction of an entirely new terminal. After environmental processes are completed and approved for a new 17- to 21-gate terminal, the ADP can be revised.

OAK airport management noted that 600,000 is the average number of annual passengers that is currently achieved per gate. It is reasonable to assume that a total of 34 gates would be developed at the Airport and are likely within a ten-year timeframe (2015). With 34 gates, 20.4 MAP could be accommodated by 2015. Even if the Airport were able to increase the gate utilization by 10 percent, only 22.4 MAP could be accommodated. OAK airport management has indicated that at 25 MAP, significant constraints to the runway system will be experienced, along with the constraints imposed by the gate limitations.

In projecting demand beyond a ten-year timeframe given the current constraints, a conservative approach must be used to provide passenger projections for use in BART ridership estimates. Therefore, based on the existing constraints of both gates and runways, a 2030 projection of 25 MAP is proposed for use in this analysis.

The conditions that could occur that would increase this projection for OAK include the following:

- Ability to develop a new terminal (beyond 34 gates that are projected)
- Ability to study (planning and environmental), design and construct a new runway
- Ability to increase gate utilization beyond 600,000 passengers per gate

While there are numerous events that could decrease these projections including significant events such as 9/11, additional airline bankruptcies, or drastic economic downturn, the OAK MP projections were developed conservatively. For purposes of this study, it is recommended that 25 MAP be used as the 2030 passenger projection.

Chapter 3
OAC AGT SYSTEM RIDERSHIP FORECAST

There are two very distinct general markets for the proposed OAC AGT system: air passengers and airport employees. Two different approaches were used to estimate the OAC AGT system ridership for these two markets.

RIDERSHIP FORECAST FROM EXISTING AIR PASSENGER MARKET

The ridership potential for the OAC AGT system was estimated by first forecasting the total number of air passengers traveling to OAK from the surrounding area and then applying the airport access mode choice model to estimate the share of these air passengers likely to choose the OAC AGT system for the land trip to the airport.

Base Year Total Travel Demand

The total OAK air passenger market was first estimated for the base year (2006) based on an airport survey conducted in September 2006. The survey was designed to identify the local origin of air passengers flying out of OAK by the four market segments used in the mode choice model. The four market segments are:

1. **Business Residents:** Travelers living in the nine-county Bay Area whose air travel is for business purpose.
2. **Business Visitors:** Travelers living outside the nine-county Bay Area whose air travel is for business purpose.
3. **Non-Business Residents:** Travelers living in the nine-county Bay Area whose air travel is for non-business purpose (vacation, visiting friends, personal business, etc.).
4. **Non-Business Visitors:** Travelers living outside the nine-county Bay Area whose air travel is for non-business purpose.

A total of 1,693 valid surveys of departing air passengers were obtained during the period of September 10, 2006 to September 24, 2006. Passengers were surveyed at their departure gate. The survey plan was designed to cover a representative sample of departing passengers by airline (Southwest versus other airlines), destination (California versus other destinations), day of week, and time of day. Detailed OAK airport survey methodology and results are discussed in Appendix A of this report.

Each survey was then weighted to represent the proportion of air travelers by each of the four factors listed above and then expanded to the 2006 Origin-Destination (non-connecting) departing air passengers from OAK, as shown in Table 3.1. Based on this analysis, the total *departing* passengers ("enplanements") out of OAK is estimated to be about seven million passengers.

Table 3.1
2006 OAKLAND AIRPORT PASSENGERS

Airline	Destination	Connecting PAX 2006	Total OD Enplanements 2006	Total OD Deplanements 2006	TOTAL 2006
WN*	California	147,329	2,222,216	2,234,499	4,604,044
WN*	Other Domestic	130,481	1,972,415	1,974,627	4,077,523
Other	California	31,480	478,360	473,895	983,735
Other	Other	154,710	2,348,485	2,331,502	4,834,698
	TOTAL	464,000	**7,021,477**	7,014,523	14,500,000

Note: * International Air Transport Association (IATA) designation for Southwest Airlines

While the home location of the surveyed passengers permitted identification of their residential status, another key element provided was the address of their departure point to OAK. This information was summarized by zip code and is shown in graphic form on the next page. Air passengers originating outside the nine-county Bay Area were not considered potential riders to the proposed OAC AGT system. About 3.7 percent of departing air passengers were in this category. The proportion of the remaining passengers (96.3 percent) by market segment was estimated from the expanded survey and is shown in the following table. Therefore, the total departing passengers having the potential to ride the OAC AGT system is estimated to be 6.7 million people annually (7.0 million passengers x 96.3 percent = 6.7 million passengers).

Table 3.2
2006 DEPARTING BAY AREA AIR PASSENGERS BY MARKET SEGMENT

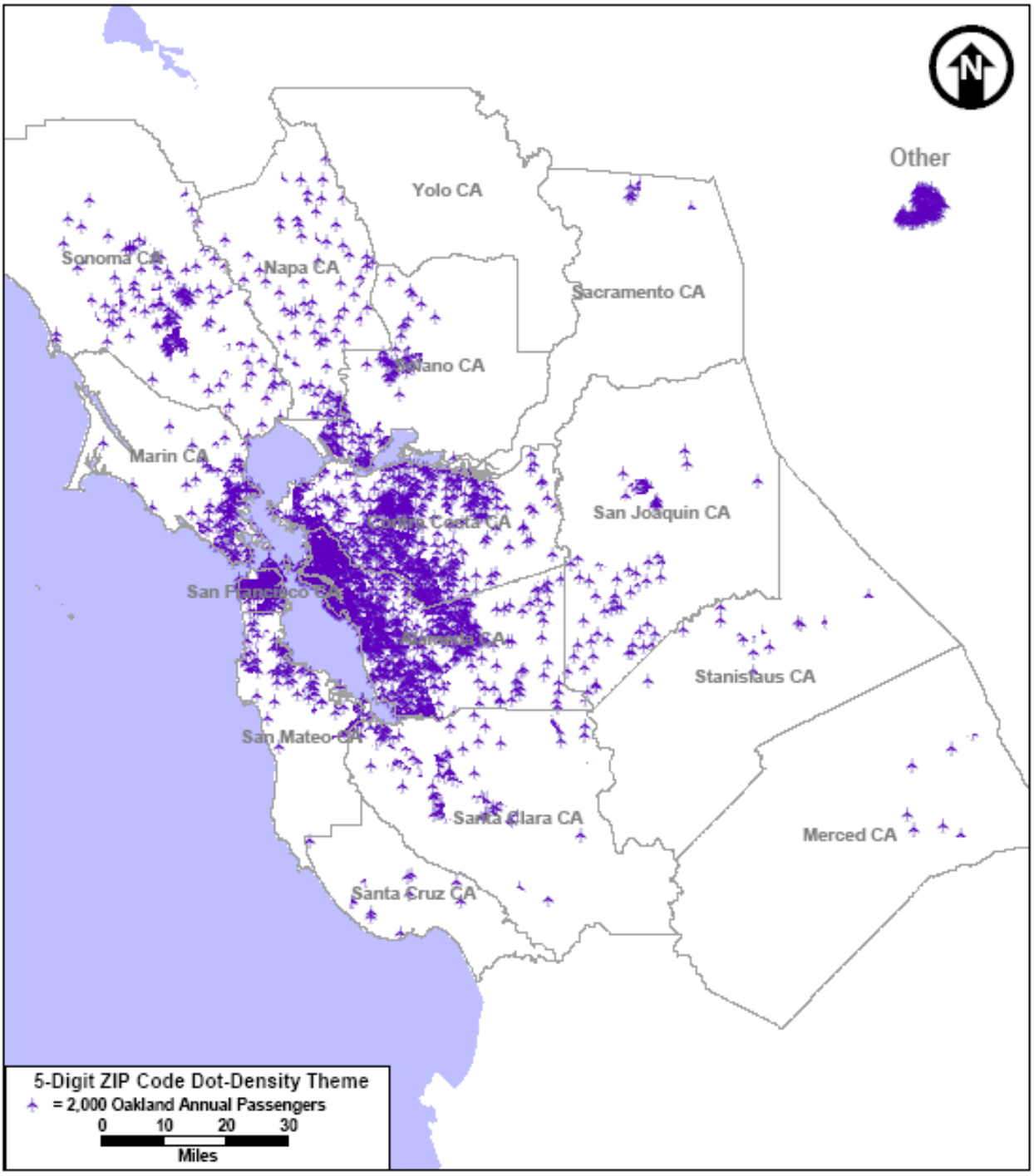
	Resident		Visitor		Total	
Purpose	2006 PAX	Percent	2006 PAX	Percent	2006 PAX	Percent
Business	1,331,523	19.7%	1,204,062	17.8%	2,535,585	37.5%
Non-Business	2,565,741	38.0%	1,657,807	24.5%	4,223,548	62.5%
Total	3,897,264	57.7%	2,861,870	42.3%	6,759,133	100.0%

Existing Air Passenger Access Mode Choice Model

The mode choice model used to estimate the proportion of air passengers using each mode of access to OAK requires fairly detailed information about travel time (highway and transit times), travel distance (to estimate some of the costs), and transit fares. Much of this information was gathered from the Bay Area MPO travel demand model network (MTC Model) on a zone basis. So, the total travel demand by zip code obtained from the airport survey had to be further divided by zone. This distribution from zip code to zone was done as follows:

- Establish the geographic correspondence between zip codes and zones.
- Calculate various weights for each zone within a zip code corresponding to the type of origin of the air travelers (number of households for home origin, service employment for hotel origin, total employment for place of work origin, etc.).
- Distribute each airport expanded survey to the zones included in the zip code using the appropriate weight.
- Summarize by zone and the four market segments.

Figure 3.1
OAKLAND AIRPORT ORIGINATING PASSENGERS BY ZIP CODE



It should be noted that the weight for home origin took into account the income of the households in that zone. Since the average income of air passengers is higher than the average income of the overall population, households with higher income were weighted more heavily for each zone. The resulting mode share for OAK's air passengers under existing conditions is presented in Table 3.3. The mode share for BART is currently at about 7.9 percent (highlighted in blue), which accounts only for departing air passengers, but not non-air passenger travelers. When both departing air passenger and non-air passenger BART riders to OAK are added, the mode share is approximately 9.2%.

Table 3.3
2006 MODE SHARES FOR AIR PASSENGERS ACCESS TO THE OAKLAND AIRPORT

Market Segment	Car Parked	Dropped off	Rental car	Taxi	Other Private	BART	Other Public	Total
Business								
Resident	56.0%	29.5%	0.0%	2.1%	4.9%	5.7%	1.9%	100.0%
Non-Resident	0.0%	15.6%	43.1%	16.5%	13.6%	10.5%	0.6%	100.0%
Total	29.4%	22.9%	20.5%	8.9%	9.0%	8.0%	1.3%	100.0%
Non-Business								
Resident	28.1%	49.5%	0.0%	2.8%	11.0%	7.3%	1.4%	100.0%
Non-Resident	0.0%	47.2%	21.4%	6.1%	15.4%	8.9%	1.0%	100.0%
Total	17.0%	48.6%	8.4%	4.1%	12.7%	7.9%	1.3%	100.0%
TOTAL	21.7%	39.0%	12.9%	5.9%	11.3%	7.9%	1.3%	100.0%

Source: Oakland Airport and AirBART bus system On-Board Surveys adjusted by actual AirBART bus system Ridership

Using the survey results and the MTC mode choice model, it was estimated that about 535,000 passengers would use BART and then the AirBART bus system on their way *to* the airport (7.9 percent x 6.7 million departing passengers = 535,000 departing passengers on BART). WSA then estimated the current (2006) ridership for the AirBART bus system, including passenger trips *from* the airport, accompanying visitors, and airport employees. The results are presented in Table 3.4 below. Existing conditions estimation shows that a total of 1.29 million annual passengers (or about 3,500 daily passengers) use the AirBART bus system as part of their commute to and from OAK.

Table 3.4
2006 AirBART BUS SYSTEM RIDERSHIP ESTIMATION

2006 Total Annual Air BART

	To Airport	From Airport	TOTAL
Air PAX	535,400	605,500	1,140,900
Accompanying	28,500	28,500	57,000
Employees	32,500	32,500	65,000
Others*	12,100	12,100	24,200
TOTAL	**608,500**	**678,600**	**1,287,100**

Sources: (1) On-Board Air BART Survey, September 2006
(2) Monthly Air BART Ridership thru September 2006;
extrapolated to December 2006
(3) Consultant Calculations

* "Others" include visitors to the airport to purchase tickets, collect baggage, send packages, and other business.

Future Year Total Travel Demand

Once the base year total travel demand was estimated by market segment and zone, future year total travel demand was estimated by applying the proportionate growth represented by the OAK air passenger forecasts

from the *WSA Independent Review of OAK Master Plan Forecasts,* using the constrained (gate, terminal and runway) forecasts shown in Table 3.5.

Table 3.5
OAKLAND AIRPORT CONSTRAINED FORECAST

Year	MAP	Total Growth from 2006	Avg Annual Growth
2006	14.5	-	-
2010	17.4	20.0%	4.7%
2011*	17.7	22.1%	4.1%
2030	25	72.4%	2.3%

* Estimated by interpolation

Source: Wilbur Smith Associates

In applying this forecast to the estimate of total demand, the percentage of connecting passengers was assumed to stay at 3.2 percent as in the base year, and the percentage of travelers originating outside the nine-county Bay Area was also assumed to stay at its 2006 level of 3.7 percent. The resulting air passenger forecasts are summarized in Table 3.6. By year 2011, there would be 8.2 million departing passengers annually at OAK (22.1 percent growth added to 6.7 million), and by 2030 this number would be about 11.6 million passengers (72.4 percent growth added to 6.7 million).

Table 3.6
OAKLAND AIRPORT AIR PASSENGERS FORECASTS

Year	Connecting PAX	Total OD Enplanements	Total OD Deplanements	TOTAL	OD Enplanments From Bay Area
2006	464,000	7,021,477	7,014,523	14,500,000	6,759,133
2011	566,981	8,579,841	8,571,344	17,718,167	8,258,955
2030	800,000	12,105,995	12,094,005	25,000,000	11,653,232

As in the base year, the distribution of air passengers originating from each zone took into account the relative growth in population (weighted by income), service employment and total employment of each zone. The resulting forecasts by market segment are shown in Table 3.7 for 2011, and Table 3.8 for 2030.

Table 3.7
2011 DEPARTING AIR PASSENGER FORECAST BY MARKET SEGMENT

	Resident		Visitor		Total	
Purpose	**2011 PAX**	**Percent**	**2011 PAX**	**Percent**	**2011 PAX**	**Percent**
Business	1,616,521	19.6%	1,500,731	18.2%	3,117,253	37.7%
Non-Business	3,106,686	37.6%	2,035,016	24.6%	5,141,702	62.3%
Total	4,723,208	57.2%	3,535,747	42.8%	8,258,955	100.0%

Table 3.8
2030 DEPARTING AIR PASSENGER FORECAST BY MARKET SEGMENT

	Resident		Visitor		Total	
Purpose	2011 PAX	Percent	2011 PAX	Percent	2011 PAX	Percent
Business	2,382,149	20.4%	2,176,140	18.7%	4,558,289	39.1%
Non-Business	4,189,048	35.9%	2,905,895	24.9%	7,094,943	60.9%
Total	6,571,198	56.4%	5,082,034	43.6%	11,653,232	100.0%

NO BUILD SCENARIO (CONTINUE USING EXISTING AIRBART BUS SYSTEM)

Under the No Build Scenario, the AirBART bus system will continue serving the connection between OAK and BART through year 2030. Without any changes, the AirBART bus system ridership will grow according to the Oakland airport constrained growth forecast presented in Table 3.5 above. This assumes that the percentage mode share served by the AirBART bus system remains constant. Combining the existing BART/AirBART bus system riders presented in Table 3.4 with the growth rates found in Table 3.5, the 2011 forecasted ridership under this scenario is expected to be about 1.57 million passengers (22.1 percent growth added to 1.29 million BART passengers = 1.57 million annually, or about 4,410 per day). Similarly, year 2030 ridership is estimated to be 2.21 million passengers (72.4 percent growth added to 1.29 million BART passengers = 2.21 million annually, or about 6,030 per day). Values may vary slightly due to rounding. Table 3.9 below summarizes this observation.

Table 3.9
NO BUILD RIDERSHIP FORECAST

Year	Growth Rate	Annual BART Ridership	Daily BART Ridership
2006	0.0%	1,287,100	3,500
2011	22.1%	1,571,549	4,410
2030	72.4%	2,218,960	6,030

BASELINE OAC AGT SYSTEM CHARACTERISTICS

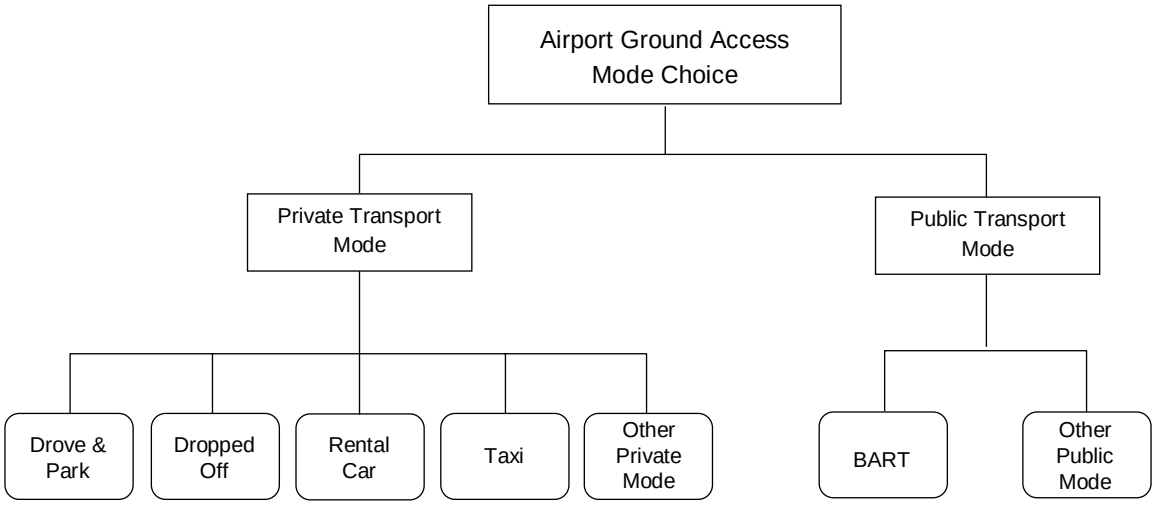
The proposed OAC AGT system is expected to be operational by year 2011, and will include the following operational characteristics:

- OAC AGT System Travel Time from end station to end station: 6.2 minutes;
- No intermediary station present;
- Fare: $5 one-way, integrated with BART system;
- Headway: 3.2 minutes from 6:00 AM to 8:00 PM, 4.1 minutes from 8:00 PM to midnight, 12.4 minutes from 5:00 AM to 6:00 AM; and
- Transfer walk-time at airport: same as current AirBART bus system (which uses recently constructed third curb island).

Future Air Passenger Access Mode Choice Model

The mode choice model used to estimate the *future* share of air travelers to OAK that would use the OAC AGT system was adapted from a model developed originally for a similar study of O'Hare and Midway Airports in Chicago. The Chicago models, one for business and one for non-business, are airport access behavioral models (nested logit model) which were developed based on both revealed and stated preference surveys of air passengers at the two airports. Figure 3.2 shows the nested mode choice model structure. Both the business and non-business use the same modeling structure but with different coefficients.

Figure 3.2
MODE CHOICE MODEL STRUCTURE



All models included choice among the different modes of access to the airport: Drive and park, Dropped off, Rental car, Taxi, Limo, Hotel/Airport van and shuttle, BART and AC transit. The models were applied by market segment to the number of air travelers going to the airport from each zone as explained previously.

To apply these mode choice models, travel time, travel cost and other data for each of the potential modes of access to the airport were developed in a manner consistent with the airport access mode choice model specifications. These included:

- Travel times: Access time to the main mode, time spent on the main mode (in-vehicle time), and egress time to the airport ticketing/check-in area. For public mode of transportation, half of the headway was included in the access time.
- Travel costs included the following as appropriate for each mode: car operating costs, parking costs, rental car costs, taxi/limousine fares, transit fares. Travel costs were adjusted for both the party size and the length of stay as appropriate.
- Other data needed for model application included: the proportion of travel to the airports during peak period as travel time varies depending on the time period and the percentage of travelers with high income ($100,000 or above).

When calibrating the mode choice models, the AirBART bus system was considered as the egress mode to the BART system. In other words, BART was considered as the main mode of access to the airport and the time spent on the AirBART bus system was penalized like other access and egress times by a factor of 1.25 for business and 1.50 for non-business markets. When the mode choice models are applied to forecast the OAC AGT system ridership, the time spent on the OAC AGT system is considered as part of the main mode of access and is not penalized. Other than the improvements in travel characteristics of the OAC AGT system such as travel time, fare, headway etc. the difference in treatment between the AirBART bus system and the OAC AGT system is that the first is a mode of access to BART, while the other is considered as another BART system line. If the OAC AGT system is considered more attractive than the BART system to potential travelers, the OAC AGT system ridership will be underestimated. Sensitivity tests which address that issue are presented in a later section. Tables 3.10 and 3.11 present a summary of the mode of access to the airport for air travelers departing from OAK for years 2011 and year 2030 respectively. The annual boardings for OAC AGT system from air travelers to OAK are 925,000 in 2011 and 1.3 million in 2030, representing a growth of about 47 percent between 2011 and 2030, or two percent on an annual basis.

Table 3.10
2011 FORECAST OF AIR PASSENGERS BY MODE OF ACCESS

	Drive&Park	Drop Off	Rental	Taxi	Other Priv.	OAC AGT	Other Pub.	Total
Market Segment	Annual Trips	Annual Trips	Annual Trips	Annual Trips	Annual Trips	Annual Trips	Annual Trips	Annual Trips
Business								
Residents	889,109	470,335	-	33,089	77,124	**133,867**	12,998	1,616,521
Visitors	-	223,527	616,399	229,761	194,124	**234,754**	2,165	1,500,731
Total	889,109	693,862	616,399	262,850	271,248	**368,621**	15,163	3,117,253
Non-Business								
Residents	854,732	1,516,062	-	84,619	335,022	**296,851**	19,400	3,106,686
Visitors	-	929,690	421,410	112,701	301,748	**259,487**	9,980	2,035,016
Total	854,732	2,445,752	421,410	197,321	636,770	**556,338**	29,379	5,141,702
OAK TOTAL	1,743,841	3,139,614	1,037,809	460,171	908,019	**924,959**	44,542	8,258,955

	Modal Share	Modal Share	Modal Share	Modal Share	Modal Share	Modal Share	Modal Share	Modal Share
Business								
Residents	55.0%	29.1%	0.0%	2.0%	4.8%	**8.28%**	0.8%	100.0%
Visitors	0.0%	14.9%	41.1%	15.3%	12.9%	**15.64%**	0.1%	100.0%
Total	28.5%	22.3%	19.8%	8.4%	8.7%	**11.83%**	0.5%	100.0%
Non-Business								
Residents	27.5%	48.8%	0.0%	2.7%	10.8%	**9.56%**	0.6%	100.0%
Visitors	0.0%	45.7%	20.7%	5.5%	14.8%	**12.75%**	0.5%	100.0%
Total	16.6%	47.6%	8.2%	3.8%	12.4%	**10.82%**	0.6%	100.0%
OAK TOTAL	21.1%	38.0%	12.6%	5.6%	11.0%	**11.2%**	0.5%	100.0%

Table 3.11
2030 FORECAST OF AIR PASSENGERS BY MODE OF ACCESS

Market Segment	Drive&Park Annual Trips	Drop Off Annual Trips	Rental Annual Trips	Taxi Annual Trips	Other Priv. Annual Trips	OAC AGT Annual Trips	Other Pub. Annual Trips	Total Annual Trips
Business								
Residents	1,302,080	691,672	-	48,783	114,635	**207,697**	17,282	2,382,149
Visitors	-	321,124	885,544	334,226	285,366	**347,130**	2,750	2,176,140
Total	1,302,080	1,012,797	885,544	383,009	400,001	**554,827**	20,031	4,558,289
Non-Business								
Residents	1,149,980	2,033,183	-	114,499	454,413	**411,943**	25,030	4,189,048
Visitors	-	1,305,364	591,973	163,954	439,066	**392,803**	12,735	2,905,895
Total	1,149,980	3,338,547	591,973	278,453	893,479	**804,747**	37,764	7,094,943
OAK TOTAL	2,452,061	4,351,343	1,477,517	661,462	1,293,480	**1,359,573**	57,796	11,653,232
	Modal Share	**Modal Share**	**Modal Share**	**Modal Share**	**Modal Share**	**Modal Share**	**Modal Share**	**Modal Share**
Business								
Residents	54.7%	29.0%	0.0%	2.0%	4.8%	**8.72%**	0.7%	100.0%
Visitors	0.0%	14.8%	40.7%	15.4%	13.1%	**15.95%**	0.1%	100.0%
Total	28.6%	22.2%	19.4%	8.4%	8.8%	**12.17%**	0.4%	100.0%
Non-Business								
Residents	27.5%	48.5%	0.0%	2.7%	10.8%	**9.83%**	0.6%	100.0%
Visitors	0.0%	44.9%	20.4%	5.6%	15.1%	**13.52%**	0.4%	100.0%
Total	16.2%	47.1%	8.3%	3.9%	12.6%	**11.34%**	0.5%	100.0%
OAK TOTAL	21.0%	37.3%	12.7%	5.7%	11.1%	**11.7%**	0.5%	100.0%

OAC AGT System Ridership Forecast for All Markets (Except Employees)

The above forecast is for departing air travelers from OAK only. The mode choice model was not applied separately for the land trip of air travelers arriving by air at OAK. Instead, the number of the OAC AGT system potential trips from these travelers was estimated from the above forecast. Ridership data from the existing AirBART bus system indicates that there are slightly more riders *from* the airport than *to* the airport. It was assumed that a similar phenomenon would apply to the proposed OAC AGT system.

Similarly, the AirBART bus system on-board survey showed that other than airport employees, a small percentage of passengers were not going to the airport to fly out of OAK but instead were accompanying air passengers or were going to the airport for other reasons including getting or returning rental cars and having a business meeting at the airport.

It was assumed that the sizes of these small markets are proportional to the level of activity at the airport and if the OAC AGT system is more attractive to air travelers than the AirBART bus system, it will be more attractive to these markets as well. The potential OAC AGT system ridership from these small markets was estimated to be in the same proportion as the ratio of departing air travelers that would be the OAC AGT system riders to the total departing air travelers as estimated from the AirBART bus system on-board survey.

Tables 3.12 and 3.13 present the ridership forecast for the base case OAC AGT system service for all markets except airport employees which is addressed in the following section.

Table 3.12
2011 TOTAL OAC AGT SYSTEM RIDERSHIP FROM ALL MARKETS EXCEPT EMPLOYEES

Market	To Airport	From Airport	TOTAL
Air PAX	924,959	1,046,128 (2)	1,971,087
Accompanying (1)	49,208	49,208	98,416
Others (1)(3)	20,904	20,904	41,808
TOTAL	995,071	1,116,240	2,111,311

Notes: (1) Estimated as the same % of OAC AGT air PAX as for Air BART in base year
(2) Assume same ratio of OAC AGT air passengers "from Airport" to "to Airport" as for Air BART in base year
(3) Others include business at airport, picking up car rental, etc.

Table 3.13
2030 TOTAL OAC AGT SYSTEM RIDERSHIP FROM ALL MARKETS EXCEPT EMPLOYEES

Market	To Airport	From Airport	TOTAL
Air PAX	1,359,573	1,537,677 (2)	2,897,251
Accompanying (1)	72,329	72,329	144,659
Others (1)(3)	30,726	30,726	61,453
TOTAL	1,462,629	1,640,733	3,103,362

Notes: (1) Estimated as the same % of OAC AGT air PAX as for Air BART in base year
(2) Assume same ratio of OAC AGT air passengers "from Airport" to "to Airport" as for Air BART in base year
(3) Others include business at airport, picking up car rental, etc.

OAC AGT System Ridership Forecast for Airport Employees

For those working at the airport, the trip to the airport is not significantly different from any other trip to work. For this reason, the Metropolitan Transportation Commission (MTC) model was used to estimate potential ridership on the OAC AGT system from this market. The MTC model is a traditional four step model (trip generation, trip distribution, mode choice, traffic assignment) which separates commuter trips from other purposes. Model run years provided by MTC included 2006, 2015, 2020 and 2030. For this project intermediary years were interpolated.

The model was first applied with the existing AirBART bus system service. The transit network was then modified to eliminate the AirBART bus system service and to add the OAC AGT system service as another BART rail line. Results from the MTC model were then adjusted in two ways as explained in the following paragraphs.

Based on the AirBART bus system on-board survey and the AirBART bus system ridership data over years provided by BART, the total 2006 annual AirBART bus system ridership from airport employees was estimated to be 64,940 for both directions. Detailed results of the AirBART bus system on-board survey can be found in Appendix B. The 2006 MTC model estimate for the AirBART bus system was significantly lower than this estimate. To compensate for this underestimation, the MTC model results for the OAC AGT system service were used as pivot point, i.e. the ratio of the OAC AGT system ridership to base year AirBART bus system ridership from the MTC model was applied to the observed base year AirBART bus system ridership to estimate the potential OAC AGT system ridership.

The air passenger forecast for OAK as presented earlier in Table 3.5 corresponds to a growth in passenger traffic of 72.4 percent from 2006 to 2030. During the same period, the MTC model shows a growth in employment for the airport zone of only 17 percent. While the air travel industry is becoming more and

more efficient, economic studies of Civil Aviation indicate a closer relationship between air travel growth and related employment growth. For the purpose of this study, employment at OAK was assumed to grow at half the rate of air passenger activity and the number of work trips to/from OAK from the MTC model was adjusted accordingly.

With these two adjustments to the MTC model, the OAC AGT system ridership from Airport employees was estimated. The 143,000 employees/OAC AGT system riders in 2030 correspond to an increase of 120 percent over the 2006 employee AirBART bus system ridership of 65,000.

Table 3.14
OAC AGT SYSTEM RIDERSHIP FROM AIRPORT EMPLOYEES

Year	To Airport	From Airport	TOTAL
2011	47,900	47,900	95,800
2030	71,400	71,400	142,800

Combined OAC AGT System Ridership Forecast

Using the two forecasts for both airport employees and the general target market, Tables 3.15 and 3.16 present the total baseline OAC AGT system ridership forecasts for years 2011 and 2030. Future ridership is expected to reach 2.2 million and 3.2 million passengers by years 2011 and 2030, respectively (about 6,050 and 8,900 daily passengers, respectively). The OAC AGT system is expected to improve ridership by about 40 percent in year 2011, and 46 percent in year 2030 over the existing AirBART bus system.

Table 3.15
2011 OAC AGT SYSTEM RIDERSHIP FORECAST

	To Airport	From Airport (2)	TOTAL
Air PAX	924,959	1,046,128	1,971,087
Accompanying (1)	49,208	49,208	98,416
Employees (3)	47,900	47,900	95,800
Others (1)	20,904	20,904	41,808
TOTAL	**1,042,971**	**1,164,140**	**2,207,111**

Notes: (1) Estimated as the same % of air PAX as in base year
(2) Assume same ratio of air passengers "from Airport" to "to Airport" as in base year
(3) Estimated using MTC Model and increasing MTC growth in employment at the airport to at least half the growth in enplanement and deplanement

Table 3.16
2030 OAC AGT SYSTEM RIDERSHIP FORECAST

	To Airport	From Airport (2)	TOTAL
Air PAX	1,359,573	1,537,700	2,897,273
Accompanying (1)	72,329	72,329	144,659
Employees	71,400	71,400	142,800
Others (1)	30,726	30,726	61,453
TOTAL	**1,534,029**	**1,712,156**	**3,246,185**

Notes: (1) Estimated as the same % of air PAX as in base year
(2) Assume same ratio of air passengers "from Airport" to "to Airport" as in base year
(3) Estimated using MTC Model and increasing MTC growth in employment at the airport to at least half the growth in enplanement and deplanement

SENSITIVITY TESTS

A number of sensitivity tests were conducted for two main purposes: (1) to verify that the models used to prepare the forecast were behaving reasonably; and (2) to test some of the assumptions going into the forecast.

Sensitivity to Fare

The base case OAC AGT system ridership assumed a one-way fare of $5 which is significantly higher than the current AirBART bus system fare of $2. A sensitivity test was conducted to estimate the OAC AGT system ridership assuming the OAC AGT system fare of $2. Both the airport access models for air travelers and the MTC model for employees were rerun with a $2 fare. The change in ridership for departing air travelers is shown in Table 3.17.

Table 3.17
OAC AGT SYSTEM RIDERSHIP SENSITIVITY TO FARE FROM AIR TRAVELERS

Departing Air	2011 AGT Ridership		Arc Elasticity to		2030 AGT Ridership		Arc Elasticity to	
Travelers Market	$5	$2	AGT Fare	Total Fare	$5	$2	AGT Fare	Total Fare
Business								
Residents	133,867	156,318	-0.18	-0.41	207,697	241,173	-0.17	-0.39
Visitors	234,754	269,205	-0.16	-0.35	347,130	393,276	-0.15	-0.32
Total	368,621	425,523	-0.17	-0.37	554,827	634,449	-0.16	-0.35
Non-Business								
Residents	296,851	368,309	-0.25	-0.57	411,943	507,661	-0.24	-0.55
Visitors	259,487	320,855	-0.25	-0.55	392,803	471,275	-0.21	-0.46
Total	556,338	689,164	-0.25	-0.56	804,747	978,937	-0.23	-0.51
TOTAL	924,959	1,114,687	-0.22	-0.49	1,359,573	1,613,386	-0.20	-0.44

As shown, two elasticities were calculated. For a majority of travelers to the airport using the OAC AGT system, it is only one part of their trip and the total fare paid is higher than just the OAC AGT system fare. Elasticities of less than negative one (-1) are considered elastic, while elasticities of between negative one (-1) and zero (0) are considered inelastic.

The elasticity to the OAC AGT system fare only was found to be extremely inelastic (-0.22 in 2011 and -0.20 in 2030), or changes in price would have very little impact on ridership. However, this view could be misleading, as the percentage change in total fare is lower than just the change in the OAC AGT system fare. On the other hand, the elasticity to total fare appears reasonable. As expected, they are still relatively inelastic, but to a lesser degree than the OAC AGT system fare-only comparisons. Furthermore, the business

market shows less sensitivity to fare than the non-business market. It indicates that for business travelers, price is less of a concern over other factors such as convenience, timeliness, availability of airport parking, or price of airport parking.

In summary, the total fare sensitivity analysis shows that changes in price would bring considerable impact to ridership, but still limited, or inelastic. The reasons for the limited impacts could be attributed to factors other than the fare price, as mentioned above. Table 3.18 shows the change in ridership from airport employees due to the same fare change.

Table 3.18
OAC AGT SYSTEM RIDERSHIP SENSITIVITY TO FARE FROM AIRPORT EMPLOYEES

	2011 AGT Ridership		Arc Elasticity to	2030 AGT Ridership		Arc Elasticity to
Market	**$5**	**$2**	**AGT Fare**	**$5**	**$2**	**AGT Fare**
Airport Employee	47,900	58,950	-0.24	71,400	90,309	-0.27

As would be expected, the elasticity to fare is higher overall for employees who have to do the trip regularly than for air travelers who make the trip to the airport much less often (compared to -0.22 in 2006 and -0.20 in 2030 for all non-employee riders, presented in Table 3.17).

Overall, the OAC AGT system ridership from all markets due to a change in fares is shown in Table 3.19. These ridership figures were synthesized from Tables 3.15 and 3.16, and were factored up according to the MTC model's predicted increase due to the reduction in fare. On average, the OAC AGT system ridership would increase by 20.6 percent in 2011 and 19.0 percent in 2030 when fares are reduced from $5 to $2.

Table 3.19
OAC AGT SYSTEM RIDERSHIP SENSITIVITY TO FARE

	2011 AGT Ridership			2030 AGT Ridership		
Market	**$5**	**$2**	**% Change**	**$5**	**$2**	**% Change**
Air PAX	1,971,087	2,375,398	20.5%	2,897,251	3,438,125	18.7%
Accompanying	98,416	118,603	20.5%	144,659	171,664	18.7%
Employees	95,800	117,900	23.1%	142,800	180,618	26.5%
Others	41,808	50,384	20.5%	61,453	72,925	18.7%
TOTAL	2,207,111	2,662,284	20.6%	3,246,162	3,863,333	19.0%

Sensitivity to OAC AGT System Attractiveness

As explained earlier, the mode choice models used for the air passenger market assume that the OAC AGT system is similar to the existing BART system. A sensitivity test was conducted to estimate the impact on ridership of considering OAC AGT system as a BART system rather than a mode similar to the AirBART bus system, which is considered a mode of *access to* BART. Results of this test are presented in Table 3.20. Considering the OAC AGT system as part of the BART system rather than mode of access to BART resulted in a base case ridership about five percent higher.

Table 3.20
IMPACT ON RIDERSHIP WHEN CONSIDERING
OAC AGT SYSTEM AS BART INSTEAD OF ACCESS MODE (AIR PASSENGERS TO AIRPORT)

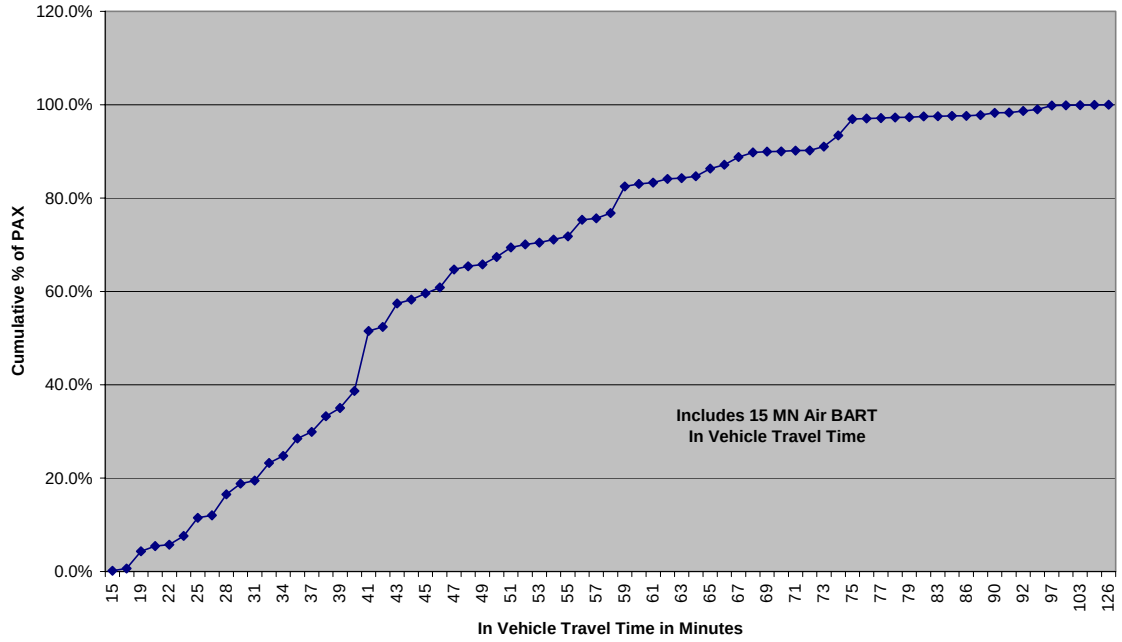
	2011 AGT Riders			2030 AGT Riders		
Market Segment	**As Rail**	**As Bus**	**% Change**	**As Rail**	**As Bus**	**% Change**
Business						
Residents	133,867	128,174	-4.3%	207,697	198,968	-4.2%
Visitors	234,754	225,786	-3.8%	347,130	334,065	-3.8%
Total	368,621	353,960	-4.0%	554,827	533,033	-3.9%
Non-Business						
Residents	296,851	278,540	-6.2%	411,943	386,712	-6.1%
Visitors	259,487	244,238	-5.9%	392,803	370,231	-5.7%
Total	556,338	522,778	-6.0%	804,747	756,943	-5.9%
TOTAL	924,959	876,738	-5.2%	1,359,573	1,289,976	-5.1%

While the above test indicates that the modeling approach does give an advantage to the OAC AGT system service over the existing AirBART bus system service, that advantage may potentially be larger. If travelers consider the OAC AGT system portion of their trip more attractive than a regular train and sufficiently more attractive that they alter their choice of overall mode of access to the airport, the base case OAC AGT system ridership could be underestimated.

The mode choice models were developed originally for a similar study in Chicago. This study estimated ridership for a new Airport Express train service going directly without stops from downtown Chicago to the Airport that would have competed with the existing CTA rapid transit lines serving the airports. The mode choice models developed from stated preference surveys of Chicago airports users did indicate that travelers considered the proposed Airport Express as a more attractive mode than the existing CTA train beyond the improved service characteristics. As a result the Airport Express itself was treated as a new mode. However, for those travelers needing to use CTA to access the proposed Airport Express, the CTA portion of the trip was considered as access and thus penalized. In Chicago, many travelers could access the downtown Airport Express station directly and if they needed to use CTA, it represented a small portion of the overall trip to the airport.

For the present study, the OAC AGT system was not considered equivalent to the existing AirBART bus system service but equivalent to a BART train. It was not considered as a new mode as in Chicago because the OAC AGT system ride is only a small portion of the overall trip to the airport as shown in the figure below.

Figure 3.3
TRANSIT IN-VEHICLE TRAVEL TIME - TRIP LENGTH DISTRIBUTION
OAK AIR PASSENGERS USING THE AIRBART BUS SYSTEM



Without a stated preference survey of the potential OAC AGT system riders, it is difficult to establish whether the limited portion of the trip to the airport on the OAC AGT system would make users consider the trip significantly more attractive. It can be argued that at least a portion of the trip to the airport could be considered more attractive.

A sensitivity test was conducted which included one-fourth of the "added attractiveness" of the Airport Express from the Chicago mode choice model (the nested logit modal constant for BART was adjusted) while still considering the existing BART system portion of the trip as part of the main mode (and not access to the OAC AGT system). Results of this sensitivity test are shown in Table 3.21.

Table 3.21
OAC AGT SYSTEM RIDERSHIP SENSITIVITY TO ATTRACTIVENESS (AIR PAX TO AIRPORT)

	2011 OAC Ridership Forecast			2030 OAC Ridership Forecast		
Market Segment	**Orig. Cst**	**Adj. Cst**	**% Change**	**Orig. Cst**	**Adj. Cst**	**% Change**
Business						
Residents	133,867	140,518	5.0%	207,697	217,886	4.9%
Visitors	234,754	245,128	4.4%	347,130	362,228	4.3%
Total	368,621	385,645	4.6%	554,827	580,114	4.6%
Non-Business						
Residents	296,851	337,852	13.8%	411,943	468,362	13.7%
Visitors	259,487	293,274	13.0%	392,803	442,636	12.7%
Total	556,338	631,126	13.4%	804,747	910,998	13.2%
TOTAL	924,959	1,016,771	9.9%	1,359,573	1,491,112	9.7%

As shown, with this assumption, the OAC AGT system ridership would be about ten percent higher. The non-business market is more affected than the business market because the former was favoring the Airport Express over CTA to a greater extent than the latter in the Chicago study. Similar sensitivity tests for the employee market were not conducted because the mode choice parameters in the MTC Model were not accessible for this study and no data is available to gauge the added attractiveness of the OAC AGT system for work trips to the airport.

In WSA's *BART to Oakland Airport Connector Ridership Update* (2005), the impact of the OAC AGT system's attractiveness on ridership was estimated to be much higher. The Chicago methodology mostly accounted for the accessibility and ease of use of the system, which was more conservative. Other service quality factors, such as timeliness, method of payment flexibility, and travel comfort were not included in the Chicago forecast. According to the 2005 report, OAC AGT system attractiveness attributed to these factors were estimated to increase ridership by an additional eight percent, resulting in a total sum of 18 percent (10 percent from Chicago methodology + 8 percent due to increased service quality = 18 percent).

Sensitivity to Airport Parking Costs

The final sensitivity analysis was performed on the impacts of airport parking costs to the OAC AGT system ridership. Under existing conditions, long-term airport parking at OAK averages $12 per day. Sensitivity tests were performed with 30 percent, 50 percent, and 75 percent increases in parking fees, which are expected to increase demand for OAC AGT system ridership. The results are summarized in Table 3.22. Based on the analysis, a parking fee increase of 30 percent would result in a 3.4 percent increase in ridership, and behaves almost linearly with further increases. At 75 percent fee increase, OAC AGT system ridership is expected to increase by seven percent.

Table 3.22
OAC AGT SYSTEM RIDERSHIP SENSITIVITY TO AIRPORT PARKING FEES

Average Airport Parking Fee	Fee % Incr	Ridership % Change
$ 12.00	0%	0.0%
$ 15.60	30%	3.4%
$ 18.00	50%	5.0%
$ 21.00	75%	7.0%

Chapter 4
CONCLUSIONS

BACKGROUND

The previous chapter presented the methodology for the development of a baseline forecast of the OAC AGT system ridership. Forecasts of the OAC AGT system ridership were provided at various levels of air passenger activity. Tests of the sensitivity of the ridership results were also provided showing the impacts of changes in the OAC AGT system fares, airport parking costs, and the attractiveness of the OAC AGT system. This chapter builds upon the information presented in Chapter 3 to develop a range of ridership forecasts which explore the implications of variations in each of the sensitivity factors. The ridership estimates were also developed on a year-by-year basis from 2006 to 2030. The key factors that were considered included:

1. **Air Passenger Forecast Constraints** – Historical air passenger growth at OAK has been much higher than that predicted by any of the three available air passenger forecasts. Constraints on terminal capacity limits the growth at OAK to about 20.0 Million Annual Passengers (MAP) which the OAK Master Plan indicates would be achieved by 2013. Runway capacity is expected to limit growth to about 25.0 MAP which the Master Plan indicates would occur in the year 2020. The assumptions about the ability of OAK to expand its infrastructure are critical to the growth of the airport and to the use of the OAC AGT system. Once air passenger growth reaches the level were the capacity of the system is reached, some gradual growth can still be expected as the population of the service area of the airport grows and the airlines, the airport, and air travelers adjust to the crowded conditions.
2. **Airport Parking Costs** – Airport parking costs, both on and off the airport site have increased steadily with the growth of the airport. The amount of land available for parking on the airport is very constrained and expansion of the total amount of available parking is unlikely. Expansion of airport facilities is likely to decrease the amount of surface parking space and past studies have suggested that even if a parking structure is built in the main terminal area or additional airport property is converted to surface parking to replace this displaced parking, the total supply of parking is likely to remain the same or less than the current supply. Limited land is also available for off-airport parking and development pressures are likely to limit further expansion of this supply. As the use of the airport continues to grow parking prices are likely to increase.
3. **OAC AGT System Attractiveness –** The baseline forecast assumed that the OAC AGT system would have a level of "attractiveness" to potential riders similar to the current attractiveness of the BART system. This means that users would perceive the comfort and convenience of the OAC AGT system to be similar to that of the BART system. The OAC AGT system patrons will need to pass through separate fare gates, but they will be integrated in the BART fare collection system, unlike the AirBART bus system which employs separate ticketing and fare collection systems. Because the OAC AGT system represents such a significant improvement over the current AirBART bus system service, it is likely the potential riders may find it more attractive in relative terms than BART. For example, the forecasting technique does not account for the major difference in expected reliability between the OAC AGT system and the current AirBART bus system. There will also be no need to purchase a separate ticket or pay a separate fare to ride the OAC AGT system, and passengers will be able to transfer between BART and the OAC AGT system service without leaving the BART station and without passing through fare gates or paying a fare.

REFINED RIDERSHIP FORECASTS

Based on the considerations above, four ridership forecast scenarios were developed and are presented here:

- **OAC AGT System-Low:** Represents a more conservative forecast even compared against the base case, essentially assuming that the air passenger growth will be capped at 20.0 MAP due to terminal capacity constraints.
- **OAC AGT System-Medium:** Very similar to the Baseline Scenario, but with a 30 percent increase in airport parking fees;
- **OAC AGT System-High:** Assumes higher increases in airport parking fees and increased OAC AGT system attractiveness; and
- **OAC AGT System-Hybrid:** Assumes levels of OAC AGT system attractiveness that are more consistent with the results of the previous ridership forecasts for the EIR/EIS, but are still less than that assumed at that time.

OAC AGT System-Low Scenario

In addition to the basic operational characteristics mentioned above, this scenario was analyzed with the following assumptions:

- Air Passenger Growth: Capped at 20 Million Annual Passengers (MAP) by 2013;
- Annual Growth: Two percent after 2013;
- OAC AGT system attractiveness: OAC AGT system will be no more attractive than the BART system (+0 percent); and
- Airport Parking Fees: No increases (+0 percent).

Prior to the start-up of the OAC AGT system the growth of the ridership on AirBART bus system was assumed to grow at a rate consistent with the growth of air passenger volumes at the airport as discussed in Chapter 3 under the No-Build Scenario. A two-year "ramp-up" period for the transition from the AirBART bus system to OAC AGT system was assumed, meaning that full forecast growth in OAC AGT system ridership would not occur all at once. Starting at year 2011, the OAC AGT system's opening year, ridership would ramp-up until year 2013, where growth would be capped at 20 MAPS (one of this Scenario's assumptions). After the two year ramp-up period, growth was assumed to level off to 2 percent per year consistent with the population growth rate forecast for the region served by the airport.

Figure 4.1 presents the year-by-year ridership forecast for this Scenario, using the above-mentioned assumptions. According to the analysis results, opening year (2011) ridership under this scenario would be approximately 5,400 daily riders, increasing to 9,700 riders per day by year 2030. This is approximately 2.76 times the existing daily AirBART bus system ridership of 3,500 riders per day.

OAC AGT System-Medium Scenario

- Air Passenger Growth: Capped at 25 MAP by 2020;
- Annual Growth: Two percent after 2020;
- OAC AGT system attractiveness: OAC AGT system will be no more attractive than the BART system (+0 percent); and

- Airport Parking Fees: 30 percent increase (+3.4 percent).

In this scenario air passenger growth was capped at 25.0 MAP. This MAP level assumes that the airport would have some success in increasing the number of gates or the efficiency of use of the gates by the year 2020 and that runway capacity will be the constraint. This scenario also assumes a 30 percent increase in parking costs over current levels. Based on the sensitivity analysis summarized in Table 3.21, a 30 percent increase in parking fees would result in a 3.4 increase in BART ridership. After applying this increase, the initial growth rate between 2006 (existing) and 2011 (OAC AGT system opening year) was also assumed to be 2.3 percent, just like in the OAC AGT System-Low Scenario. Between 2011 and 2020 (ramp-up final year, where growth was assumed to be capped at 25 MAPs), total growth was projected to be 47 percent (3.24 million at 25 MAPs / 2.21 million passengers in 2011 = 47 percent growth), the average annual growth rate was found to be 5.2 percent per year. Afterwards, the growth rate was again assumed to level off to 2 percent annually.

The year-by-year ridership forecasts are presented in Figure 4.1. By 2011 (opening year), there would be about 5,400 daily riders, which would grow to about 11,200 daily riders by year 2030, or about 3.20 times current ridership.

OAC AGT System-High Scenario

- Air Passenger Growth: Capped at 30 MAP by 2025;
- Annual Growth: Two percent after 2025;
- OAC AGT system attractiveness: (+9 percent); and
- Airport Parking Fees: 50 percent increase (+5 percent).

This scenario assumes that runway capacity will not cap airport growth at 25 MAP, and that the airport will continue to grow to the 30 MAP by 2025 consistent with the OAK Master Plan. This scenario also assumed that airport parking fees would increase by 50 percent, prompting a 5 percent increase in BART ridership. In addition, OAC AGT system was assumed to be more attractive compared to other modes of transportation. In this case, the increased attractiveness of the OAC AGT system would increase ridership by 9 percent. Please refer to the discussions in the sensitivity analysis for more details on this factor. Lastly, ramp-up period was assumed to be longer, reaching 30 MAP by year 2025. This translated to about 5.5 percent annual growth between 2011 and 2025. Beyond 2025, growth would again level off to 2 percent annually.

The year-by-year ridership projections for this scenario, as summarized in Figure 4.1, show that ridership would reach 5,900 per day by 2011, and then 12,200 by year 2030. It is approximately 3.84 times current AirBART bus system ridership.

OAC AGT System-Hybrid Scenario

- Air Passenger Growth: Capped at 30 MAPs by 2025;
- Annual Growth: Two percent after 2025;
- OAC AGT system attractiveness: (+17 percent); and
- Airport Parking Fees: 75 percent increase (+7 percent).

Lastly, this scenario is very similar to the OAC AGT System-High Scenario, with the exception of higher OAC AGT system attractiveness and airport parking factors. As discussed in the sensitivity analysis, an OAC

AGT system service that is both attractive and of high quality would increase ridership by approximately 17 percent. This level of attractiveness represents 50 percent of the attractiveness that was forecast in the previous EIR/EIS and ridership update (year 2005) efforts. Similarly, a 75 percent increase in airport parking fees would translate to about 7 percent increase in ridership.

By applying these factors into the ridership forecasts, ridership under this scenario would reach 6,200 per day by year 2011, and 14,600 per day by year 2030. Figure 4.1 presents the year-by-year ridership summary for this scenario, which was found to be about 4.17 times greater than the existing ridership of 3,500 per day.

Figure 4.1
OAC AGT SYSTEM RIDERSHIP FORECASTS

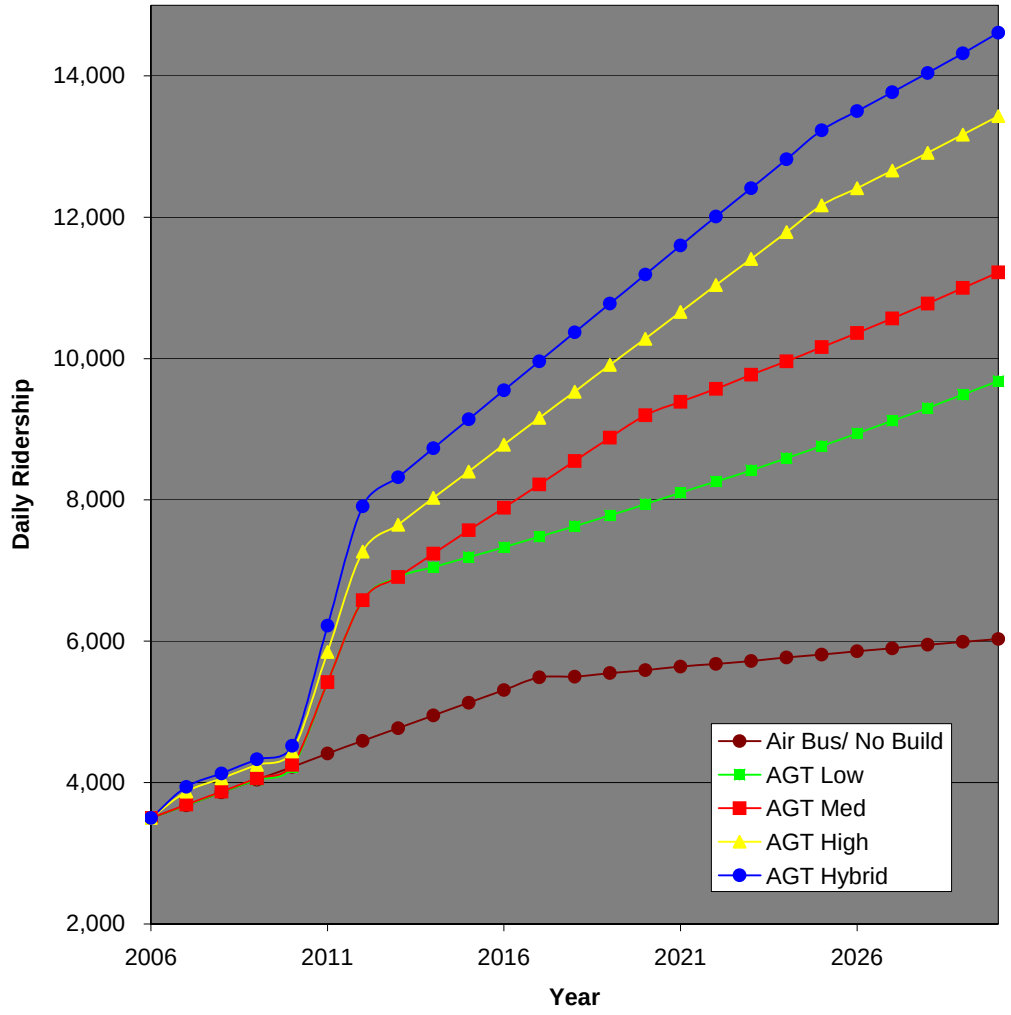


Table 4.1 presents the year-by-year patronage forecast for each of the scenarios.

Table 4.1
DAILY PATRONAGE FORECASTS BY YEAR AND MAP

Year	MAP	Daily Ridership Volumes					Period
		Air Bus/ No Build	AGT-Low	AGT-Medium	AGT-High	AGT-Hybrid	
2006	14.5	3,500	3,500	3,500	3,500	3,500	NO AGT
2007	15.3	3,680	3,680	3,690	3,870	3,940	
2008	16.1	3,860	3,860	3,870	4,060	4,130	
2009	16.9	4,040	4,040	4,060	4,250	4,330	
2010	17.8	4,220	4,220	4,250	4,440	4,520	
2011	18.6	4,410	5,420	5,420	5,850	6,220	Blue-shaded cells indicate the start of AGT RAMP-UP, and Gold-shaded cells indicate AGT MATURITY YEARS
2012	19.4	4,590	6,580	6,580	7,270	7,910	
2013	20.2	4,770	6,910	6,910	7,650	8,320	
2014	21.0	4,950	7,050	7,240	8,030	8,730	
2015	21.8	5,130	7,190	7,570	8,400	9,140	
2016	22.7	5,310	7,330	7,890	8,780	9,550	
2017	23.5	5,490	7,480	8,220	9,160	9,960	
2018	24.3	5,500	7,630	8,550	9,530	10,370	
2019	25.1	5,550	7,780	8,880	9,910	10,780	
2020	25.9	5,590	7,940	9,200	10,280	11,190	
2021	26.7	5,640	8,100	9,390	10,660	11,600	
2022	27.6	5,680	8,260	9,570	11,040	12,010	
2023	28.4	5,720	8,420	9,770	11,410	12,410	
2024	29.2	5,770	8,590	9,960	11,790	12,820	
2025	30.0	5,810	8,760	10,160	12,170	13,230	
2026	30.6	5,860	8,940	10,360	12,410	13,500	
2027	31.2	5,900	9,120	10,570	12,660	13,770	
2028	31.8	5,950	9,300	10,780	12,910	14,040	
2029	32.5	5,990	9,490	11,000	13,170	14,320	
2030	33.1	6,030	9,680	11,220	13,430	14,610	

COMPARISON WITH OTHER AIRPORTS

The forecast scenarios presented in the previous section represent a range of possible patronage yields, ranging from a possible low end, a possible high end, an a middle range of more plausible results. To better understand the most reasonable ridership projections, the ridership ratios of the peer systems from other U.S. airports were also evaluated and compared. The data were collected as part of an earlier iteration of the ridership analysis performed by WSA *(BART to Oakland Airport Connector Ridership Update, 2005)*. These peer systems were selected, because they met the following criteria:

- The airport terminal is connected directly to a rail station or via an AGT system;
- Connections made by buses were not considered;
- Both light rail and heavy rail were considered providing they fulfilled the other criteria; and
- In all cases examined, the airports also had internal AGT systems for circulation between terminals, and in some cases, connections to parking garages or other facilities.

To ensure comparability between the proposed system with other airports and other airports' systems, facilities that did not connect to another public transit system were not considered. For example, the Tampa International Airport has an AGT system that serves only to connect the parking facilities with the airport terminal, and was not included in the research. In addition, systems which rely on a bus or shuttle to connect the rail station to the airport were not considered. Boston's Logan International Airport was discounted for this reason. Finally, forecast data developed at the time the system was under consideration needed to be available. Eight U.S. airports were selected for further review. All of the following are international airports:

- San Francisco International (SFO);
- John F. Kennedy International (JFK) in New York City;
- Newark Liberty International (EWR);
- O'Hare International (ORD) in Chicago;
- Midway International (MDW) in Chicago;
- Minneapolis/Saint Paul (MSP);
- Portland International (PDX); and
- Hartsfield-Jackson Atlanta International (ATL).

Table 4.2 presents a comparison for all systems for which suitable data was available, along with the existing AirBART bus system and the various forecast Scenarios. In this table, the MAP data was reduced to annual data for passengers whose origins or destinations were in the referenced city (transfer passengers were eliminated), and ratios of daily airport rail passengers to adjusted MAP were calculated.

It is important to note that in Table 4.2 the existing AirBART bus system (No Build) already demonstrated a high performance level, matching or exceeding the mode share of three of the eight systems reviewed. The least conservative scenario (OAC AGT System-Hybrid) would rank fourth (out of nine) when compared to the peer systems, after New York's JFK, Minneapolis/St. Paul (MSP), and Chicago's Midway (MDW). The most conservative scenario (OAC AGT System-Low) would still outperform half of the eight peer systems, ranking fifth out of nine. The remaining middle scenarios (OAC AGT System-Medium and OAC AGT System-High) would also rank fifth out of nine. The rankings are shown in Table 4.2

Table 4.2
COMPARISONS WITH OTHER AIRPORT RAIL CONNECTOR SYSTEMS

	MAP at Maturity	Daily System Pax	Daily Pax/MAP	Rank Compared to Peers
New York JFK	11.7	8,250	703	-
Minneapolis-St. Paul	14.3	7,800	544	-
Chicago Midway	12.2	6,300	518	-
Atlanta	30.8	13,000	422	-
San Francisco	22.9	6,800	296	-
Chicago O'Hare	29.6	7,500	253	-
Portland	11.4	2,800	246	-
Newark Liberty	22.4	3,000	134	-
OAK Existing AirBART bus system	14.5	3,500	241	8th
OAC AGT System-Low (20 MAPs by 2013)	20.0	6,900	345	5th
OAC AGT System-Medium (25 MAPs by 2020)	25.0	9,200	368	5th
OAC AGT System-High (30 MAPs by 2025)	30.0	12,200	407	5th
OAC AGT System-Hybrid (30 MAPs by 2025)	30.0	13,200	440	4th

CONCLUSIONS

The model results presented here were developed by conservatively recognizing the limits in airport runway and terminal capacities. Furthermore, this analysis took into account that the OAC AGT system trip would only be a part of a larger trip between the OAK and the passengers' origins/destinations. Improvements in OAC AGT system travel time or quality over Air BART were measured in context with the other constant factors representing the rest of the trip.

While the first three scenarios did not attempt to quantify the intangible factors such as comfort and service reliability, the OAC AGT System-Hybrid approach provides insight into how such factors might affect ridership. Figure 4.1 presents a comparison of model forecasts for the scenarios developed for this report, up to year 2030. The AirBART bus system/No Build scenario, discussed in Chapter 3, assumed that ridership would follow the constrained growth pattern described in the OAK Master Plan. The remaining scenarios were detailed in the beginning of this Chapter, and ranged between 10,000 to 14,000 passengers per day, depending on the assumptions used.

Appendix A
OAKLAND AIRPORT SURVEY RESULTS

OAKLAND AIRPORT OAC AGT SYSTEM
AIRPORT SURVEY

A survey of air travelers departing from the Oakland Airport was designed to identify the local origin of air passengers for the following four market segments:

1. Business Residents: Travelers living in the 9 counties Bay Area whose air travel is for business purpose (including convention).
2. Business Visitors: Travelers living outside the 9 counties Bay Area whose air travel is for business purpose.
3. Non-Business Residents: Travelers living in the 9 counties Bay Area whose air travel is for non-business purpose (vacation, visiting friends, personal business, etc.)
4. Non-Business Visitors: Travelers living outside the 9 counties Bay Area whose air travel is for non-business purpose.

Results of the survey were also used to estimate some of the characteristics of air travelers that are used in the mode choice models to estimate potential ridership for the OAC AGT system - average income, party size, parking costs, etc. – and finally to estimate the proportion of air travelers using currently available modes of access to the airport.

The survey instrument (questions asked) is shown at the end of this section.

SURVEY PLAN

The survey was conducted by Godbe Research at the departing gate of selected flights.

The survey plan was designed to cover a representative sample of departing passengers by airline, destination, day of week and time of day.

The flights from which passengers were interviewed were chosen from typical daily schedules for Sunday, Tuesday, Friday, and Saturday. Flights were then grouped into four hour periods, 6:00-9:59 AM, 10:00 AM – 1:59 PM, 2:00-5:59 PM, and 6:00-8:59 PM. Flights in four hour blocks of time outside of the ones listed made up less than three percent of the total number of seats over the course of a typical day, so they were not included in the sampling plan.

In order to determine the number of flights sampled in each four hour block, the total number of seats on all flights in each block was compared. Given a target of 24 flights sampled per day a proportional distribution of seats was used to calculate the following number of flights that needed to be sampled in each four hour block based on the total number of seats on all flights in each block. The following number of flights was chosen in each of the four-hour block on each day:

- 6:00-9:59 AM – 7 flights
- 10:00 AM – 1:59 PM – 6 flights

- 2:00-5:59 PM – 7 flights
- 6:00-8:59 PM – 4 flights

Flights were next grouped into one hour blocks within each four hour block. Within each one hour block, flights were assigned a random number and prioritized based on the highest random number. Flights from which to interview passengers were selected by choosing the highest priority flights that worked with the scheduled interviewing times. Interviews of air passengers were conducted from one hour and fifteen minutes before departure until fifteen minutes before departure.

When replacing a cancelled or delayed flight, preference was given to the flight with the next highest random number that fitted into the interviewing schedule.

The survey was conducted in September 2006 on the following dates.

Day	Week 1	Week 2	Week 3
Sunday	10th	17th	24th
Tuesday	12th	19th	
Friday	15th	22nd	
Saturday	16th	23rd	

Interviewers were organized in "team" of two. For each flight selected for interviews, the team arrived at the gate one hour and fifteen minutes before departure. If the flight was a Southwest flight and people were lined up in "A," "B," and "C" lines, the interviewers questioned every fifth person, starting with the "A" line. After 20 minutes, the interviewers went to the "B" line, and after another 20 minutes they went to the "C" line for the final 20 minutes of interviewing. For other airlines, the interviewers walked down the rows of seats next to the gate interviewing every fifth person who was waiting for the designated flight. If a passenger refused to participate in the survey, then the interviewer asked the next person in line or the person sitting in the next seat. Interviewers continued surveying passengers until fifteen minutes before the scheduled departure of the flight.

A total of 1,693 valid surveys of departing air passengers were obtained.

SURVEY EXPANSION

An expansion factor was attached to each survey. These factors or weight were calculated so the expanded survey would be representative of the 2006 estimate of Origin Destination (non-connecting) departing air passengers from Oakland Airport and representative of the proportion of air travelers by the following four factors:

- Airline (Southwest versus other airlines)
- Destination (California versus other destinations)
- Day of week (weekday, Saturday, Sunday)
- Time of day (four time periods)

The 2006 departing air passengers control was obtained from the Review of the Oakland Airport Master Plan and the distribution was based on published flight schedules as shown in the following table.

2006 Oakland Airport Air Passengers

Airline	Destination	Connecting PAX 2006	Total OD Enplanements 2006	Total OD Deplanements 2006	TOTAL 2006
WN	California	147,329	2,222,216	2,234,499	4,604,044
WN	Other Domestic	130,481	1,972,415	1,974,627	4,077,523
Other	California	31,480	478,360	473,895	983,735
Other	Other	154,710	2,348,485	2,331,502	4,834,698
	TOTAL	464,000	**7,021,477**	7,014,523	14,500,000

SURVEY GEOCODING AND EDITING

One of the most important information obtained from the airport survey was the location from which air travelers departed on their way to the airport. The zip code of that location was the GeoCode used. Although it was requested during the interview, not all respondents were able to provide zip code indicating instead an address, and/or a town, and/or an hotel. The missing zip codes were added based on the other information provided. In cases where only a town was recorded and that town had more than one zip code associated with it, the zip code corresponding to downtown was used.

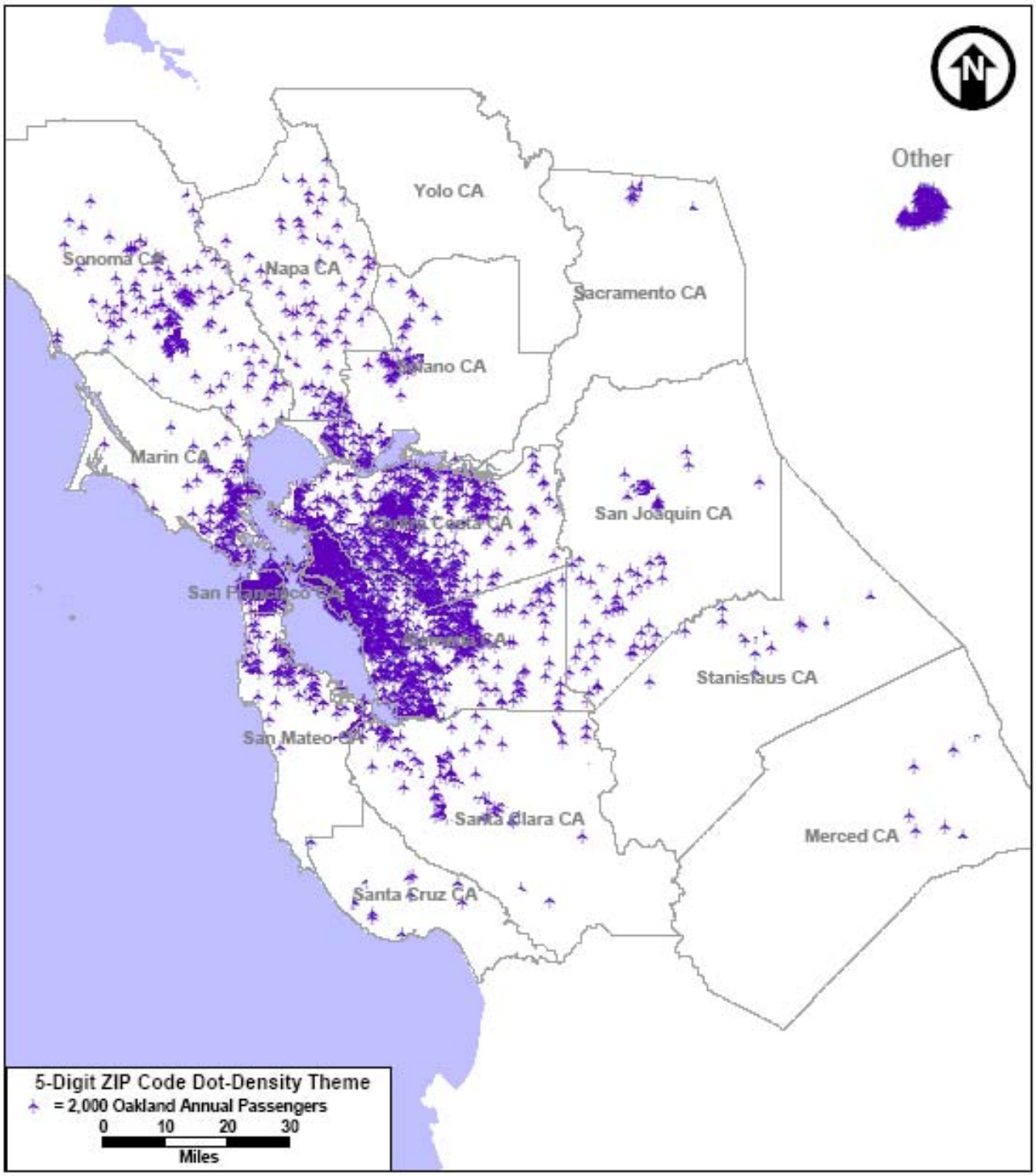
Other data items were edited as well to either correct some illogical answers or to fill unanswered question based on other responses if possible. Some examples of such edit:

- Question 5 (type of place where trip started) unanswered but Question 4 (address where trip started) indicated an hotel.
- Question 17 (purpose of trip) unanswered but indicated that trip was reimbursed by employer (question 18).
- Question 21 (where is your home) unanswered but indicated that they left from their own home (question 5) and gave the address in question 4.

SURVEY RESULTS

The following tables summarized the results of the Airport survey. It is organized to correspond to the order of the questions asked. In most cases, it shows the actual number of surveys for each answer and then the corresponding expanded number of passengers using the expansion factors described earlier. The percentages are based on the expanded survey results.

Question 4: From what address did you start your trip to the airport?
Responses to this question are best summarized by the attached map.



Oakland Airport - Originating Passengers by Zip Code

Oakland Airport Survey Results

Question 5: Type of place where ground trip to airport started

Response	No. of Surveys	2006 PAX	Percentage
Own home	848	3,689,384	52.5%
Someone else home	288	999,656	14.2%
Place of business	140	593,043	8.4%
Convention center	6	32,892	0.5%
School or College	23	88,612	1.3%
Hotel, motel, inn, etc.	334	1,356,238	19.3%
Other	54	261,651	3.7%
Total	1,693	7,021,477	100.0%

Question 6: At what time did you start your ground trip to the airport?

Response	No. of Surveys	2006 PAX	Percentage
8:00 - 13:59	743	2,506,197	35.7%
14:00 - 16:59	300	1,128,035	16.1%
17:00 - 19:59	111	670,481	9.5%
Other	539	2,716,764	38.7%
TOTAL	1,693	7,021,477	100.0%

Question 7, 9 and 10: Mode of access to the airport

Response	No. of Surveys	2006 PAX	Percentage
Car Parked	364	1,543,812	22.0%
Car Dropped off	656	2,663,922	37.9%
Rental Car	228	888,309	12.7%
Taxi	88	394,539	5.6%
Limo	25	100,815	1.4%
Shuttle	144	647,448	9.2%
AirBART	174	685,499	9.8%
AC Transit	7	49,729	0.7%
Other	7	47,404	0.7%
TOTAL	1,693	7,021,477	100.0%

Questyion 8: Needed rental car for reasons other than access to airport (Rental Car Access only)

Response	No. of Surveys	2006 PAX	Percentage
Yes	190	786,201	90.2%
No	34	84,995	9.8%
TOTAL	224	871,196	100.0%

Oakland Airport Survey Results

Question 11: Where did you park your car?
("Drove and Parked" Access only)

Response	No. of Surveys	2006 PAX	Percentage
Hourly Lot	7	34,556	2.2%
Daily Lot	87	326,590	21.2%
Long Term Lot	87	448,846	29.1%
Off Airport	183	733,821	47.5%
TOTAL	364	1,543,812	100.0%

Question 12: How long will the vehicle be parked?
("Drove and Parked" Access only)

Response	No. of Surveys	2006 PAX	Percentage
1 Day or less	88	333,790	21.6%
2 Days	72	303,336	19.6%
3-5 Days	155	757,221	49.0%
6-7 Days	23	70,828	4.6%
More than 7 days	13	56,181	3.6%
No Response	13	22,456	1.5%
TOTAL	364	1,543,812	100.0%

Question 13: How did you get to Air Bart?
(Air Bart Access only)

Response	No. of Surveys	2006 PAX	Percentage
Walk	14	36,183	5.3%
Drive & Park	1	3,186	0.5%
Dropped off	8	50,336	7.3%
Taxi	2	2,222	0.3%
BART Train	143	563,945	82.3%
Other Public	4	14,657	2.1%
Other	2	14,972	2.2%
TOTAL	174	685,499	100.0%

Question 14: How Much do you estimate it cost to travel to airport?

Mode of Access	Average Cost per person Excluding Parking at Airport ($)			
	Traveling Alone	Traveling in party	Overall Average	Number of Surveys
Car Parked	11.76	4.69	8.98	364
Car Dropped off	7.36	4.44	6.32	656
Rental Car	25.06	8.65	18.51	228
Taxi	48.87	19.70	38.09	88
Limo	73.50	27.27	56.43	25
Shuttle	21.43	13.67	17.42	144
AirBART	6.54	6.50	6.53	174
AC Transit	21.94	0.37	19.10	7
Other	43.90	0.00	43.90	7
TOTAL	15.10	7.55	12.33	1,693

Question 15: Will your ground transportation to airport be reimbursed by employer or other organization?

Mode of Access	No. of Surveys	Yes		No	
		2006 PAX	Percentage	2006 PAX	Percentage
Car Parked	364	589,991	38.2%	953,821	61.8%
Car Dropped off	656	231,498	8.7%	2,432,424	91.3%
Rental Car	228	495,100	55.7%	393,210	44.3%
Taxi	88	171,265	43.4%	223,274	56.6%
Limo	25	75,432	74.8%	25,384	25.2%
Shuttle	144	114,480	17.7%	532,968	82.3%
AirBART	174	206,964	30.2%	478,536	69.8%
AC Transit	7	13,360	26.9%	36,368	73.1%
Other	7	17,447	36.8%	29,957	63.2%
TOTAL	1,693	1,915,536	27.3%	5,105,941	72.7%

Question 16: How many people have come into the terminal just to see you off?

Mode of Access	No. of Surveys	None		1 to 5 persons	
		2006 PAX	Percentage	2006 PAX	Percentage
Car Parked	364	1,508,362	97.7%	35,450	2.3%
Car Dropped off	656	2,324,104	87.2%	339,818	12.8%
Rental Car	228	861,066	96.9%	27,244	3.1%
Taxi	88	383,309	97.2%	11,230	2.8%
Limo	25	100,815	100.0%	0	0.0%
Shuttle	144	631,791	97.6%	15,656	2.4%
AirBART	174	659,585	96.2%	25,914	3.8%
AC Transit	7	49,729	100.0%	0	0.0%
Other	7	47,404	100.0%	0	0.0%
TOTAL	1,693	6,566,164	93.5%	455,313	6.5%

Question 17: What is the primary purpose of your air trip?

Response	No. of Surveys	2006 PAX	Percentage
Business	532	2,461,654	35.1%
Convention/Trade Show	38	126,372	1.8%
Visit Friends or Relatives	459	1,603,754	22.8%
Vacation	559	2,422,571	34.5%
School	37	112,272	1.6%
Other	68	294,854	4.2%
TOTAL	1,693	7,021,477	100.0%

Question 7 and 17: Trip purpose by mode of access

Mode of Access	Number of Surveys	Percentage (Expanded Survey)	
		Business	Non Business
Car Parked	364	49.6%	50.4%
Car Dropped off	656	20.6%	79.4%
Rental Car	228	58.8%	41.2%
Taxi	88	55.0%	45.0%
Limo	25	68.0%	32.0%
Shuttle	144	22.7%	77.3%
AirBART	174	42.0%	58.0%
AC Transit	7	26.9%	73.1%
Other	7	36.8%	63.2%
TOTAL	1,693	36.9%	63.1%

Question 19: How many people in your personal travel party are flying with you?

Number of Adults	Number of Surveys	Percentage (Expanded Survey)	
		No Children	With Children
1	1,106	76.6%	23.4%
2	463	68.6%	31.4%
3	71	39.9%	60.1%
4 or more	53	41.8%	58.2%
TOTAL	1,693	71.5%	28.5%

Question 20: Checked luggages

Purpose	Number of Surveys	Percentage (Expanded Survey) Checked L.	No Checked L.
Business	570	68.0%	32.0%
Non Business	1,123	80.9%	19.1%
TOTAL	1,693	76.1%	23.9%

Question 21: Residential Status

Purpose	Resident Number of Surveys	Resident 2006 PAX	Resident Percent	Visitor Number of Surveys	Visitor 2006 PAX	Visitor Percent	TOTAL Number of Surveys	TOTAL 2006 PAX	TOTAL Percent
Business	279	1,349,783	19.2%	291	1,238,243	17.6%	570	2,588,026	36.9%
Non-Business	635	2,629,981	37.5%	488	1,803,470	25.7%	1,123	4,433,451	63.1%
TOTAL	914	3,979,764	56.7%	779	3,041,713	43.3%	1,693	7,021,477	100.0%

Question 22: Total Household Income in 2005

Income Range	Business Number of Surveys	Business 2006 PAX	Business Percent	Non-Business Number of Surveys	Non-Business 2006 PAX	Non-Business Percent	TOTAL Number of Surveys	TOTAL 2006 PAX	TOTAL Percent
Under $25,000	26	155,597	6.0%	99	395,429	8.9%	125	551,026	7.8%
$25,000 to $49,999	36	133,157	5.1%	140	670,914	15.1%	176	804,071	11.5%
$50,000 to $74,999	65	240,754	9.3%	152	661,974	14.9%	217	902,729	12.9%
$75,000 to $99,000	60	317,772	12.3%	126	491,766	11.1%	186	809,539	11.5%
$100,000 to $149,999	105	467,547	18.1%	191	710,142	16.0%	296	1,177,689	16.8%
$150,000 to $199,999	95	422,867	16.3%	114	410,870	9.3%	209	833,737	11.9%
$200,000 to $299,999	58	276,350	10.7%	66	251,921	5.7%	124	528,271	7.5%
$300,000 and over	42	176,532	6.8%	43	137,875	3.1%	85	314,406	4.5%
No Response	83	397,451	15.4%	192	702,559	15.8%	275	1,100,010	15.7%
TOTAL	570	2,588,026	100.0%	1,123	4,433,451	100.0%	1,693	7,021,477	100.0%

Oakland Airport Survey Instrument

Why this Survey is being done:

Oakland International Airport, in cooperation with BART, is conducting a survey to help improve travel to and from the airport. It will only take a few minutes of your time. All your replies are completely confidential. Your help is very important to us.

About your trip to the airport for this flight

1. **Which flight will you be taking today?**

   _____ _____ on _____ _____, 2006
   Airline Flight # Month Date

2. How many people are in your personal air travel party for this flight?

3. How did you arrive at the airport for this flight?

   ↑By air (I am connecting from another flight)

   ↑By ground transportation (this is the first leg of my air trip today)

[IF BY AIR, END INTERVIEW HERE]

4. **From what address** did you start your trip to the airport for this flight?

   _____
   Street address, with number (or name of the nearest cross street)

   _____ _____ ☐☐☐☐☐
   City or town State Zip Code

   OR (if you don't know the address)

   _____
   Building, firm, or specific location name, if applicable (e.g., hotel name, a notable building, or private firm)

5. Is the place where you started your ground trip to the airport . . . (Check one only)
   - ↑ your own home?
   - ↑ someone else's home?
   - ↑ a place of business?
   - ↑ another type of place? (Please specify) _____
   - ↑ a convention center?
   - ↑ a school or college?
   - ↑ a hotel, motel, inn, etc.?

6. **At what time** did you . . .

   leave the above starting point? _____ : _____ (Hour / Mins.) ↑ **A.M.** ↑ **P.M.**

   arrive inside the airport terminal? (before check in and security) _____ : _____ (Hour / Mins.) ↑ **A.M.** ↑ **P.M.**

7. How did you arrive at the airport **today** (or at a nearby parking or rental car facility)?

   - ↑ **private vehicle** (car, van, SUV, motorcycle, etc.) (*Continue with Q.9*)
   - ↑ **rental vehicle** (car, van, SUV, etc.) (*Continue with Q.8*)
   - ↑ **AirBART shuttle bus** (*Skip to Q.13*)
   - ↑ **AC transit bus** route (*Skip to Q13*)
   - ↑ S**cheduled airport bus** (Airporter, etc.)
     (which?) _____ (*Skip to Q.14*)
   - ↑ **taxicab** (*Skip to Q.14*)
   - ↑ **pre-arranged limousine** serving your party alone (*Skip to Q.14*)
   - ↑ **shared-ride van** providing door-to-terminal service
     *(which?)*_____ (*Skip to Q.14*)
   - ↑ **hotel/motel courtesy shuttle (free)** (*Skip to Q.14*)
   - ↑ **chartered bus** serving your travel group only (*Skip to Q.14*)
   - ↑ by some other means (*what?*) _____ (*Skip to Q.14*)

8. Did you need the rental car for reasons other than getting to and from the airport?

   ↑ Yes ↑ No

9. If you came by a private or rental vehicle, were you dropped off **at the curb** in front of the terminal entrance?
   - ↑ **yes**, I was dropped off at the terminal curb
   - ↑ **no,** I wasn't dropped off at the terminal curb

10. Was the private vehicle **driven away** without being parked, **parked for a short while** then driven away, or **parked for the duration** of your air trip?

    - ↑ **driven away** from the airport without being parked *(Skip to Q.14)*
    - ↑ **parked** for a **short while** then **driven away** by someone not flying with you
    - ↑ **parked** for the **duration of your air trip (**includes returning rental car)

11. **Where** was the vehicle parked?

- ↑ in an **hourly lot or garage** at the airport
- ↑ in a **daily lot** at the airport
- ↑ in a **long-term lot** (economy/overflow) at the airport?
- ↑ in an **off-airport** lot or garage?
- ↑ at rental park? (*Skip to question 14)*

12. **How long** was the vehicle parked or will the vehicle be parked there?

    Hours: _____ Days: _____ (*Skip to question 14)*

13. If you came to the airport by BART shuttle or AC Transit bus, **how did you get to the place where you boarded** the bus?
    - ↑ Walk
    - ↑ drive and park
    - ↑ dropped off there
    - ↑ taxicab
    - ↑ BART
      From What Station ? _____
      How did you get to that BART Station?
      ↑ Walked ↑ drove and parked ↑ dropped-off
      ↑ other transit ↑ Other
    - ↑ other public transit
    - ↑ some other way (Please specify: (_____)

14. How much do you estimate it cost to travel to the airport (including fares, gas, toll, but <u>not parking</u> at the airport) ?
    $ ___.___ ↑For me alone ↑For my party of ___ people.

15. Will your ground transportation to the airport and your parking cost **be reimbursed** by your employer or other organization? *(Don't count payment by a friend or relative as reimbursment.)*
    - ↑ **yes**, most of the costs will be paid back .
    - ↑ **no**, most of the costs will not be reimbursed

16. How many people have come into the terminal just to see you *(and other members of your travel party)* off?

    Enter the number (if none, enter zero): _____

About your air travel today

17. What was or is the primary purpose of your air trip?

    - ↑Business
    - ↑Convention/Trade Show
    - ↑Visit Friends or Relatives
    - ↑Vacation
    - ↑School
    - ↑Other (please specify) _____

18. Who is paying for your air trip today?

↑My employer or other business entity
↑Myself, friend or relative
↑Others _____ (Please specify)

19. In total, how many people **in your personal travel party** came to the airport in the same vehicle and are traveling on the same flight with you*? (Don't forget to count yourself. If none in a category, enter zero)*

Number of people aged 15 or under: _____

Number of people aged 16 or over, **including you:** _____

20. In total, how many **pieces of luggage** are all the people you counted in Question 19 taking on this flight? (*if none, enter zero)*

Total number of pieces of luggage checked: _____

Total number of pieces of cabin luggage (carry-on): _____

Finally, about yourself (for classification purposes only, will be kept confidential)

21. Where is **your home?**

_____ _____ [ ]
City or Town State or country Zip code, if in USA

22. What was the **total combined income** (before taxes) for everyone living in your Household for the year 2005? (check one only)

[] under $25,000
[] $25,00 to $49,999
[] $50,000 to $74,999
[] $75,000 to $99,999
[] $100,000 to $149,999
[] $150,000 to $199,999
[] $200,000 to $29,999
[] $300,000 and over

Thank you very much for your help.

Appendix B
AIRBART BUS SYSTEM ON-BOARD SURVEY RESULTS

OAKLAND AIRPORT BART AGT CONNECTOR
AIRBART BUS SYSTEM ON-BOARD SURVEY

A survey of AirBART bus system passengers was conducted to estimate the proportion of passengers using the AirBART bus system to get to work versus accompanying air travelers versus air passengers using the AirBART bus system as a mode of access or egress to the Oakland Airport. It also permitted to estimate the share of air travelers using AirBART more precisely than a similar estimate based only on the airport survey conducted about the same time.

The survey was also used to estimate some of the characteristics of air travelers using AirBART and compare them to the results of the airport survey.

The survey instrument (questions asked) for those interviewed on their way TO the airport is shown at the end of this section. A similar survey form was used on the way FROM the airport.

SURVEY PLAN

The survey was conducted by Wilbur Smith Associates.

The survey was designed to cover a representative sample of AirBART passengers by direction, day of week and time of day. Detailed passenger counts by direction, day of week and time of day were furnished by AirBART for the period of September 2004 to February 2005. That information was used to organize the survey and to eventually weight/expand the surveys as explained later.

The survey was conducted on the following dates:

Day	Date	Hours
Friday	Sept. 29 2006	7:00 AM to 9:00 PM
Saturday	Sept. 30 2006	9:00 AM to 8:30 PM
Sunday	Oct. 1 2006	10:00 AM to 9:30 PM
Tuesday	Oct. 3 2006	7:00 AM to 9:30 PM

Interviewers were organized in "team" of two. The teams did full runs of AirBART buses i.e. departed on an AirBART bus from the Coliseum station and stayed on the bus till it returned to the Coliseum station interviewing passengers going to the airport first and then interviewing passengers returning from the airport. One interviewer counted people boarding the bus at the Coliseum station and then at the airport and wrote them in a log sheet. Once passengers had dropped their luggage and were sited, the interviewers distributed them the survey form and a small pencil and asked them to complete the survey on the way to or from the airport. The interviewers collected the surveys from passengers towards the end of the 15 minutes trip. Surveyors were instructed to minimize potential obstruction of passengers under crowded conditions. As a result, during crowded bus runs, they did not distribute forms to standees and instructed sited passengers to leave the surveys on their sit as they were leaving instead of gathering them directly.

A total of 1,313 valid surveys of AirBART passengers were obtained. Of those, 652 were on the way to the airport including 77 surveys of people not flying, and 661 were on the way from the airport including 59 not flying.

SURVEY EXPANSION

An expansion factor or weight was attached to each survey. These weights were calculated so the expanded survey would be representative of typical weekly AirBART passengers and be representative of the proportion of passengers by the following factors:

- Day of week (weekday, Saturday, Sunday)
- Time of day (four time periods)
- Direction (to or from the airport)

The distribution by day of week and time period was based on the detailed passenger count data provided by AirBART for the period of September 2004 to February 2005. The control total was based on the total daily counts of AirBART passengers by direction on the days of the interview also provided by AirBART.

SURVEY GEOCODING AND EDITING

AirBART passengers were asked the location from which they departed or were going. The zip code of that location was the GeoCode used. Not all respondents provided zip code indicating instead an address, and/or a town, and/or an hotel. The missing zip codes were added based on the other information provided. In cases where only a town was recorded and that town had more than one zip code associated with it, the zip code corresponding to downtown was used. In some cases it was not possible to assign a zip code but the survey was kept because it could provide other information.

Other data items were edited as well to either correct some illogical answers or to fill unanswered question based on other responses if possible.

SURVEY RESULTS

The following tables summarized the results of the AirBART on-board survey. It is organized to correspond to the order of the questions asked. In most cases, it shows the actual number of surveys for each answer and then the corresponding expanded number of weekly passengers using the expansion factors described earlier. The percentages are based on the expanded survey results.

AirBART On-Board Survey Results

Question 1: Reason for going to/coming from Oakland Airport?

	To Airport			From Airport			ALL		
Response	No. Surveys	Passengers	Percent	No. Surveys	Passengers	Percent	No. Surveys	Passengers	Percent
Flying	575	9,036	88.0%	602	10,327	90.9%	1177	19,363	89.5%
Work at Airport	37	547	5.3%	32	512	4.5%	69	1,059	4.9%
Accomp. Air Traveler	28	480	4.7%	16	226	2.0%	44	707	3.3%
Business at Airport	2	33	0.3%	5	67	0.6%	7	100	0.5%
Other*	10	171	1.7%	6	223	2.0%	16	394	1.8%
TOTAL	652	10,268	100.0%	661	11,355	100.0%	1313	21,623	100.0%

* Many "other" were to drop or pickup a rental car

Question 1 was answered by all AirBART passengers. Results for all other questions are summarized only for passengers flying in or out of Oakland Airport.

Question 2: Where did you start/will you finish your trip?

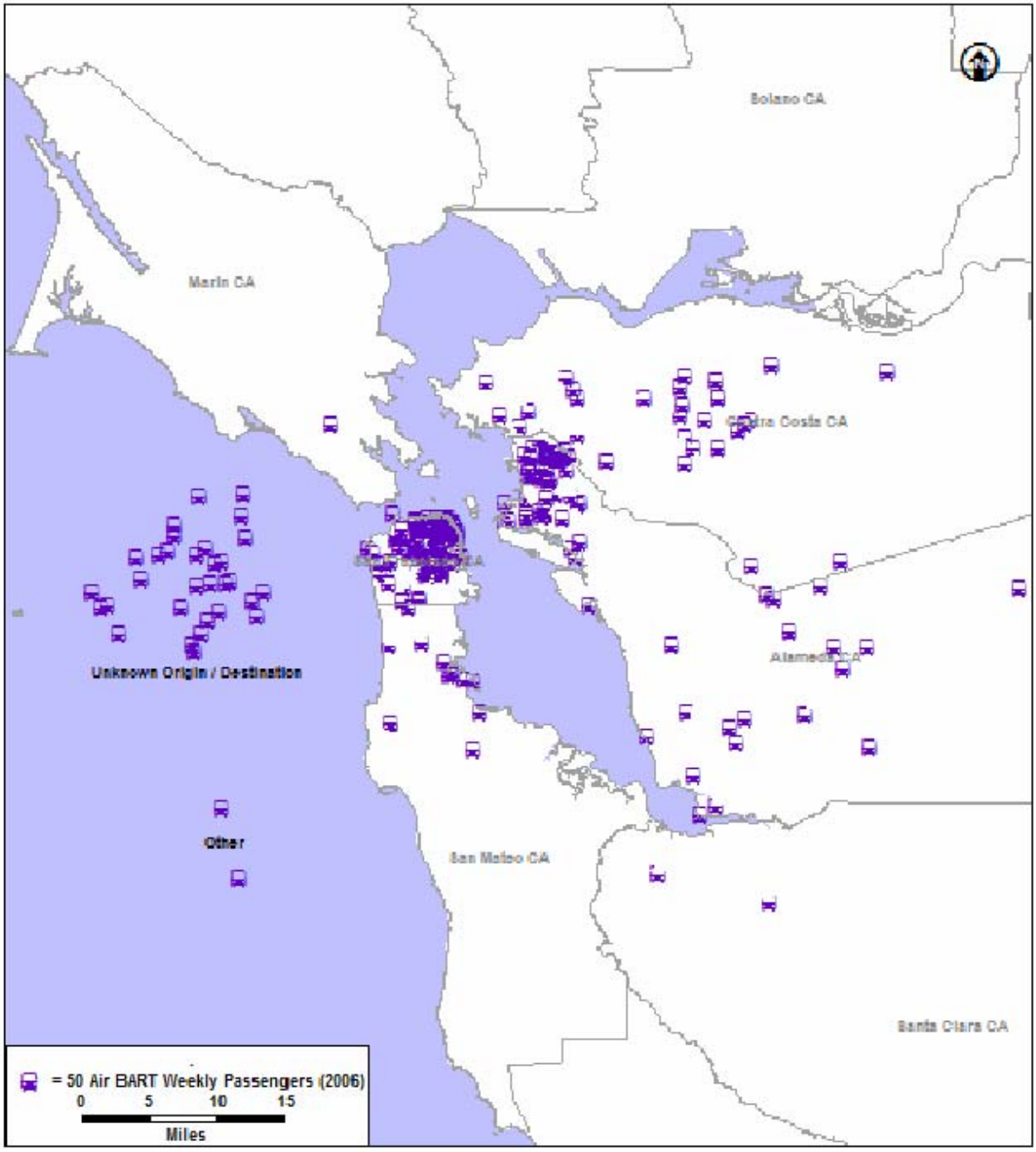
	To Airport			From Airport			ALL		
Response	No. Surveys	Passengers	Percent	No. Surveys	Passengers	Percent	No. Surveys	Passengers	Percent
Own Home	274	4,281	47.4%	285	4,192	40.6%	559	8,473	43.8%
Someone else Home	78	1,055	11.7%	85	1,667	16.1%	163	2,722	14.1%
Business Place	84	1,708	18.9%	78	1,624	15.7%	162	3,332	17.2%
Hotel or Motel	102	1,382	15.3%	118	2,219	21.5%	220	3,601	18.6%
Convention Center	2	43	0.5%	2	44	0.4%	4	87	0.5%
School or College	16	315	3.5%	17	215	2.1%	33	530	2.7%
Other	14	179	2.0%	12	266	2.6%	26	446	2.3%
No Answer	5	73	0.8%	5	99	1.0%	10	172	0.9%
TOTAL	575	9,036	100.0%	602	10,327	100.0%	1177	19,363	100.0%

Question 3: At what address did you start (will you end) your trip?
Responses to this question are best summarized by the attached map.

Question 4: What Airline did you/will you use?

	To Airport			From Airport			ALL		
Response	No. Surveys	Passengers	Percent	No. Surveys	Passengers	Percent	No. Surveys	Passengers	Percent
Southwest	429	6,790	75.1%	371	6,099	59.1%	800	12,889	66.6%
Another Airline	136	2,109	23.3%	227	4,162	40.3%	363	6,272	32.4%
No Answer	10	136	1.5%	4	66	0.6%	14	202	1.0%
TOTAL	575	9,036	100.0%	602	10,327	100.0%	1177	19,363	100.0%

Air BART Passengers by Zip Code of Origin or Destination



AirBART On-Board Survey Results

Question 5: What is/was the primary purpose of your air trip today?

	To Airport			From Airport			ALL		
Response	**No. Surveys**	**Passengers**	**Percent**	**No. Surveys**	**Passengers**	**Percent**	**No. Surveys**	**Passengers**	**Percent**
Business	178	2,910	32.2%	201	3,921	38.0%	379	6,832	35.3%
Convention/Trade Show	21	299	3.3%	14	205	2.0%	35	504	2.6%
Visit Friends/Relatives	242	3,915	43.3%	221	3,450	33.4%	463	7,365	38.0%
Vacation	85	1,277	14.1%	135	2,282	22.1%	220	3,559	18.4%
School	8	136	1.5%	9	135	1.3%	17	271	1.4%
Other	41	499	5.5%	22	334	3.2%	63	833	4.3%
TOTAL	575	9,036	100.0%	602	10,327	100.0%	1,177	19,363	100.0%

Question 6: Who is paying for your air trip today?

	To Airport			From Airport			ALL		
Response	**No. Surveys**	**Passengers**	**Percent**	**No. Surveys**	**Passengers**	**Percent**	**No. Surveys**	**Passengers**	**Percent**
Employer or Business	160	2,690	29.8%	157	3,067	29.7%	317	5,758	29.7%
Myself, friend or Relative	404	6,221	68.8%	426	6,915	67.0%	830	13,136	67.8%
Other	6	66	0.7%	10	168	1.6%	16	234	1.2%
No Answer	5	59	0.7%	9	176	1.7%	14	235	1.2%
TOTAL	575	9,036	100.0%	602	10,327	100.0%	1,177	19,363	100.0%

Question 7: How did you get to this Air BART shuttle bus?

	To Airport			From Airport			ALL		
Response	**No. Surveys**	**Passengers**	**Percent**	**No. Surveys**	**Passengers**	**Percent**	**No. Surveys**	**Passengers**	**Percent**
Walked	19	238	2.6%	10	203	2.0%	29	441	2.3%
BART Rail	541	8,592	95.1%	586	10,008	96.9%	1127	18,599	96.1%
AC Transit	1	8	0.1%	2	51	0.5%	3	59	0.3%
Drove	2	40	0.4%	0	0	0.0%	2	40	0.2%
Dropped off	5	79	0.9%	0	0	0.0%	5	79	0.4%
Taxi	2	24	0.3%	1	8	0.1%	3	32	0.2%
Other	1	13	0.1%	1	21	0.2%	2	33	0.2%
No Answer	4	43	0.5%	2	37	0.4%	6	80	0.4%
TOTAL	575	9,036	100.0%	602	10,327	100.0%	1177	19,363	100.0%

AirBART On-Board Survey Results

Question 8: How did you get to the BART train or AC Transit bus?

Response	To Airport			From Airport			ALL		
	No. Surveys	Passengers	Percent	No. Surveys	Passengers	Percent	No. Surveys	Passengers	Percent
Walked	267	4,476	52.1%	260	4,482	44.6%	527	8,959	48.0%
Another BART train	82	1,288	15.0%	85	1,284	12.8%	167	2,572	13.8%
Drove	14	190	2.2%	28	362	3.6%	42	552	3.0%
Dropped off	97	1,443	16.8%	108	2,156	21.4%	205	3,599	19.3%
Taxi	41	569	6.6%	66	1,097	10.9%	107	1,666	8.9%
Other	23	318	3.7%	27	422	4.2%	50	740	4.0%
No Answer	18	315	3.7%	14	255	2.5%	32	570	3.1%
TOTAL	542	8,600	100.0%	588	10,059	100.0%	1130	18,658	100.0%

Question 9: How many people on this bus are in your air travel party including yourself?

Number of Persons	To Airport			From Airport			ALL		
	No. Surveys	Passengers	Percent	No. Surveys	Passengers	Percent	No. Surveys	Passengers	Percent
1	380	6,363	70.4%	403	6,873	66.6%	783	13,236	68.4%
2	148	2,008	22.2%	160	2,774	26.9%	308	4,781	24.7%
3	16	275	3.0%	20	306	3.0%	36	582	3.0%
4 or More	31	390	4.3%	19	374	3.6%	50	764	3.9%
TOTAL	575	9,036	100.0%	602	10,327	100.0%	1,177	19,363	100.0%

Question 10: Residential Status

Residential Status	To Airport			From Airport			ALL		
	No. Surveys	Passengers	Percent	No. Surveys	Passengers	Percent	No. Surveys	Passengers	Percent
Resident	238	4,212	46.6%	303	4,526	43.8%	541	8,738	45.1%
Visitor	337	4,824	53.4%	299	5,801	56.2%	636	10,625	54.9%
TOTAL	575	9,036	100.0%	602	10,327	100.0%	1,177	19,363	100.0%

Question 11: Total Household Income in 2005

Income Range	To Airport			From Airport			ALL		
	No. Surveys	Passengers	Percent	No. Surveys	Passengers	Percent	No. Surveys	Passengers	Percent
Under $50,000	139	2,290	25.3%	111	1,781	17.2%	250	4,072	21.0%
$50,000 to $99,999	157	2,395	26.5%	174	2,916	28.2%	331	5,311	27.4%
$100,000 to $149,999	98	1,494	16.5%	107	1,936	18.8%	205	3,430	17.7%
$150,000 and over	114	1,825	20.2%	136	2,376	23.0%	250	4,201	21.7%
No Response	67	1,032	11.4%	74	1,317	12.8%	141	2,349	12.1%
TOTAL	575	9,036	100.0%	602	10,327	100.0%	1,177	19,363	100.0%

AirBART On-Board Survey Instrument

On Board BART Airport Shuttle Questionnaire (TO airport)

Oakland International Airport, in cooperation with BART, is conducting a survey to help improve travel to and from the airport. All your replies are completely confidential. Thank you for your help in responding to this survey.

Please return your completed questionnaire to one of the surveyors or leave on your seat.

1. Why are you going to the airport? (check one)
   - ☐ Take a flight
   - ☐ Work at/around the airport
   - ☐ Accompanying someone taking a flight or picking someone up
   - ☐ Conduct business at/around the airport
   - ☐ Other (please specify) _____

2. Where did you start your trip? (check one)
   - ☐ Your own home
   - ☐ Someone else's home
   - ☐ A place of business
   - ☐ A hotel, motel
   - ☐ A convention center
   - ☐ A school or college
   - ☐ Other(please specify) _____

3. What is the address?

   _____
   Street address or street with nearest cross street City or town Zip Code
   OR IF YOU DON'T KNOW THE SPECIFIC ADDRESS, please include the building/company name and City.

If you are going to Oakland Airport to catch a plane, please answer the remaining questions.
If you are NOT flying today, stop here. Thank you for your help!

4. On what airline will you fly today? ☐ Southwest ☐ Another Airline

5. What was or is the primary purpose of your air travel? (Check one)
   - ☐ Business
   - ☐ Convention/Trade Show
   - ☐ Visit Friends or Relatives
   - ☐ Vacation
   - ☐ To or from School
   - ☐ Other (Please specify) _____

6. Who is paying for your air trip today? (Check one)
   - ☐ My employer or other business entity
   - ☐ Myself, friend or relative
   - ☐ Other (please specify) _____

7. How did you get to this AirBART shuttle bus? (Check one)
   - ☐ Walked _____ (how many blocks?)
   - ☐ Transferred from BART
   - ☐ Transferred from an AC Transit bus
   - ☐ Drove myself to the Coliseum Station
   - ☐ Someone dropped me off at Coliseum Station
   - ☐ Took a taxi to the Coliseum Station
   - ☐ Other(please specify) _____

8. If you got to this AirBART shuttle by BART or AC Transit, how did you get to the BART train or AC Transit bus? (Check one)
   - ☐ Walked _____ (how many blocks?)
   - ☐ Transferred from another BART train or transit bus
   - ☐ Drove myself and parked at that station/bus stop
   - ☐ Someone dropped me off at that station/bus stop
   - ☐ Took a taxi to that station/bus stop
   - ☐ Other(please specify) _____

9. How many people on this bus are in your air travel party <u>including yourself</u>? _____

10. Where is your home? _____
    City or Town State or country US Zip code

11. What was the total combined income (before taxes) for everyone living in your Household for the year 2005? (Check one)
    - ☐ Less than $49,999
    - ☐ $50,000 to $99,999
    - ☐ $100,000 to $149,999
    - ☐ $150,000 or over

Thank you very much for your help. You may record any additional comments on the back of this survey.